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NOTICES.—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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Forthcoming Exhibitions

Two exhibitions which are to be held in London, and for which arrangements are now in progress, promise to be of considerable interest to members of the chemical industry—namely, the Industrial Mining Exhibition next month, and the British Empire Exhibition next year. The former for the moment commands more immediate attention, as it begins on Friday, June 1, and continues until Thursday, June 14, in the Royal Agricultural Hall. These international mining exhibitions, of which the first was held twenty years ago, have always been of interest. They were established with the object of promoting the welfare of the mining industry generally, and to bring together producers, manufacturers, inventors, scientists, and investors, whose interests are interdependent and whose joint activities are a prime factor in the welfare of the mining industry. Sir John Cadman, president of the Institution of Mining Engineers, is president this year. A number of representatives of chemical science are among the vice-presidents, including Professor Sir William Pope, Professor Wyndham R. Dunstan, Sir Robert Hadfield and Professor J. S. Haldane; while Monsieur Paul Kestner and Monsieur Jean Jadot are among those representing the French and Belgian Societies.

The Institution of Petroleum Technologists is arranging a number of conferences. Several of the departments are responsible for exhibits, such as that of the Geological Survey Department, the Mines Department, the Imperial Mineral Resources Bureau, the Imperial Institute, and the Imperial College of Science and Technology. The Association of British Chemical Manufacturers is also among the associations interested in the Exhibition; it has been invited and has agreed to be one of the patrons. It has also been arranged that during the Exhibition lectures will be delivered by Mr. E. I. Lewis (Albright and Wilson, Ltd.) and Mr. Edmund White, B.Sc., F.I.C. (Hopkin and Williams, Ltd.), on the importance of the fine chemical industry. It is expected that these lectures will be of value to those engaged in industries which are dependent, to so large an extent, on fine chemicals.

With regard to the British Empire Exhibition (1924), the general arrangements are progressing slowly, but those for the Chemical Section are well advanced. An ideally-situated space in the big Industrial Hall has been secured by the Association of British Chemical Manufacturers, which is responsible for the organisation of the Section. This space is about 37,500 square ft. in area and is in the north-west corner of the hall. It is surrounded by two 75 ft. main gangways, and has running through a portion of it a 25 ft. gangway, so that altogether there are three main entrances, one of which faces the visitor on arriving from the railway station. The other two are from the main avenue running from the north right through the Exhibition to the Stadium. The total amount of space which has been reserved, by about 85 firms, is just over 33,000 sq. ft., including the necessary space allowed for gangways. There is, therefore, only room for a few more firms in this Section, and none but early applications have any chance of being included. A well-known architect has been approached to design the general scheme for the whole Section, and within the Section there will be plenty of room to display the individuality of the exhibitors. No particular space has yet been allotted to a single exhibitor in this Section, but as soon as the total amount which can be allowed has been taken up, a Committee of the Exhibitors themselves will allot the spaces for the firms in accordance with the general scheme suggested by the architect. In this way it is hoped that a most impressive exhibit of British Chemical Industry will result.

The usual industrial exhibits will be treated in a special manner which has not been attempted before in this country. Apart from these, there will be a sub-section devoted entirely to showing the progress of chemical science in this country during the past decade or so. In this scientific section all the scientific bodies are playing their part, and it is confidently

anticipated that the result will be unique. The Chemical Industry Club is also being pressed into service and is endeavouring to formulate a plan whereby, within the Section, there shall be a Chemical Industry Club. The plans for this are not yet very far advanced, but a place of some kind, where British chemists can meet their colleagues from abroad, is essential. Whatever doubts there may have been as to the success of the Chemical Section when the project was first mooted are now definitely removed, and a very interesting and comprehensive exhibit is assured.

German-Owned Chemical Plants in U.S.A.

THE official journal of the American Chemical Society has been considering the possibility of German capital held in American banks being used to erect chemical plants in the United States, and its conclusion is that the idea has no terrors for the American manufacturer. Discussing the situation in the Ruhr area, *Industrial and Engineering Chemistry* states that figures, the accuracy of which cannot be doubted, indicate that during recent months the cost of coal at the mouth of the mines in Germany was only slightly cheaper than the cost of coal from England delivered at the industrial plant. Moreover, the Germans are not obliged to pay reparations on coal procured from England. There is a strong indication, therefore, that the temporary dearth of Ruhr coal does not play the leading part in the present affairs of the German chemical industry, but is only one factor. That England may advance the price of coal to the Germans and possibly cut the supply to some extent is frankly recognised by American observers. There are shortages of many manufactured materials in England which the Continent had been expected to supply, but failing this their production must be undertaken at home, thus increasing the demand for English coal. Austria is feeling the coal shortage acutely. Approximately, it is stated, 200,000 lb. of dyes have been shipped to the United States from Germany in the month of February. In March these shipments reached nearly 300,000 lb., whereas it was to be expected that they would show a decline. This probably is due to the fact that the Germans are restricting their domestic consumption of dyes, and that large amounts were taken from stocks on hand as a means of holding the foreign trade and attempting to create the impression that the occupation of the Ruhr has not greatly affected the German dye industry.

"Under existing conditions," our contemporary concludes, "German manufacturers will encounter increasing difficulty in carrying on business with foreign countries. This leads to the belief that possibly these men will be compelled to erect plants abroad if they are to continue to be a factor in world trade. It is known that in the United States and England considerable bank balances are being created in dollars and pounds to the credit of these German manufacturers, and some venture the opinion that this money may find its way into such projects. Such a policy would hold no terrors for the American manufacturer since one of our outstanding objections to the German chemical industry has been its refusal to manufacture in the United States, and the use of the American market to further the industry abroad."

Royal Institution's Need of Funds

THERE can be few industrial chemists who are not aware of, or who have not profited by, the research with the aid of low temperatures with which the Royal Institution has been associated for more than a generation. In this direction the work of the late Sir James Dewar will long be regarded as one of the standard scientific classics, and it is something of a tragedy to learn that this particular branch of research is at present in abeyance owing to the condition to which the liquid air plant has come as a result of the severe work which in the past year or two has been demanded of it. During the war the plant was overtaxed in connection with the requirements of various Government Departments, and though after the war it was overhauled and put into working order at a heavy expenditure, it has again broken down. Apart from the effect which it will have on the prosecution of research at low temperatures, the throwing out of work of the plant involves a serious handicap to the activities of the Davy-Faraday Laboratory, which must necessarily be hampered by the absence of supplies of liquid gases which in the past have been used with great advantage by the workers admitted within its walls.

The reconstruction of the plant calls for a large sum—larger than could be afforded by the Institution out of its present resources—and, although no direct appeal has been made for assistance, the circumstances are such that no effort should be spared to enable the Institution to maintain its proud record in the domain of experimental research. It is pointed out that with the growing complexity and cost of scientific investigation an output such as has been realised in the past can scarcely be expected in the future if the expenditure is to remain so exiguous, and the one satisfactory way in which income can be increased is by increasing membership. The Institution is, by comparison with other institutions of the kind in this and other countries, by no means richly endowed; and when consideration is given to the exclusive and attractive series of lectures which it arranges for its members it may certainly be claimed that the annual subscription is trifling in comparison with the opportunities for gaining knowledge which membership provides.

Metallurgical Research

THE quiet progress which is being made in industrial research in this country is illustrated in the monthly circular of the British Cast Iron Research Association, one of a considerable group of associations now engaged in this work. A special committee which has been at work for some time on a standard test bar specification has decided on a basis for drawing up a national specification; agreed points have been arrived at, and a preliminary report is expected at an early date. Similar research work on internal combustion engine castings is going on. Castings defective in design and manufacture are being examined, the investigation including both the engineering and the metallurgical side. A draft specification for air-cooled and jacketed cylinders for automobiles has been considered and approved. Research into shrinkage defects has gradually broadened out to include the fundamental properties of cast iron such as liquid shrinkage, solid contraction, physical properties, corrosion, etc. The

preliminary report, to be issued shortly, will contain some valuable data upon these familiar troubles. The Association also have under consideration specifications for cast iron for piston-ring parts and also for concentric piston rings which have been prepared in co-operation with the British Engineering Standards Association.

As an encouragement to those who are only just beginning to realise the importance of research, it is stated that the production department of the United States Chamber of Commerce reports that American industries are spending 70 million dollars annually on scientific research and that as a result half a billion dollars is being saved annually by American industry. It is satisfactory to hear of research paying in so direct a fashion, but in the absence of such visible financial results expenditure on research may still be regarded as an essential form of insurance for future efficiency, and this perhaps, of the two, may be accepted as the sounder view of its part in industry.

Chemical Imports and Exports

If it is true that sulphuric acid is the life blood of this country, then not much of this important liquid flowed out during the month of March, as the exports of this product for the month in question show a marked decrease compared with the exports for March, 1922, when 8,138 cwts. were exported as against only 1,206 for this year. On the other hand, many other chemical products were exported in considerably increased quantities. Particularly is this the case with naphthalene, exports of which increased over fifteen times the 1922 figures, while in bleaching powder and coal tar dyes there were also marked increases, the last being almost certainly due to the occupation of the Ruhr district and the consequent disorganisation of a section of the German chemical industry. Another satisfactory feature is that the substances showing decreased exports, with the exception of sulphuric acid already mentioned, and barytes (including blanc fixe), have suffered only a fractional diminution, while a number of substantial increases are shown. In spite of the fact that prices as a whole are lower than a year ago the value of chemical exports taken together has increased from £1,692,973 in March, 1922, to £1,912,077 in March, 1923. Compared with March, 1921, there has been a decrease in value of only £9,729 a figure which is more than counter-balanced by the general fall in prices. The conclusion from the Board of Trade returns is that on the whole the chemical trade is undergoing a slow and healthy expansion.

"Germovea"

THE decision of Mr. Justice Eve, in the Chancery Division, on the question of the registration of a new name "Germovea," is of interest to all concerned in proprietary articles. The application for the registration of "Germovea" was made by Taylors Drug Co., Ltd., and objection was offered by the owners of "Germolene" and "Homoea." The Registrar refused the application on the ground that the new name would cause confusion, and the applicants appealed. The judge in the Chancery Division upheld the decision of the Registrar and dismissed the appeal with costs. It will be seen that "Germovea" is a combination of two names already registered—"Germe" from the one and "Cea" from the

other—and in such circumstances some confusion might certainly appear to be possible. Whether the confusion would have been of such a degree as materially to affect business is a matter, of course, for the authorities to decide, and in this case the High Court seems to have had no difficulty to deciding in favour of the Registrar's view.

Points from Our News Pages

A plan for improving and maintaining the accuracy of volumetric analysis is described in an article by R. W. W. (p. 478).

Reviews are published of a number of recent books (p. 480).

Letters appear from Dr. J. R. Partington on "The Nitrogen Industry"; Mr. W. J. U. Woolcock on "Making Colour Makers," also on "Borax Prices," "Chemists and Pharmacists," and "Income Tax Repayments" (p. 482).

Mr. L. G. Lawrie gave a paper on "Fur Dyeing" before the London Section of the Society of Dyers and Colourists on April 26 (p. 482).

The subject of the "Hydrogenation Products of Benzene and Naphthalene" was dealt with by Mr. Noel Heaton, before the Oil and Colour Chemists' Association (p. 486).

According to our London Market Report the recent depression is passing and the demand, especially in the textile districts, has improved (p. 495).

According to our Scottish Market Report, prices remained steady with a livelier tendency during the past week, though the actual number of orders remained small (p. 498).

Books Received

PRACTICAL CHEMISTRY. By E. J. Holmyard. London: G. Bell & Sons, Ltd. Pp. 267. 4s.

THE CHEMISTRY OF UREA. By Emil A. Werner. London: Longmans Green & Co. Pp. 210. 14s.

SYNTHETIC RESINS AND THEIR PLASTICS. By Carleton Ellis. New York: The Chemical Catalog Co., Inc. Pp. 514. \$6.00.

TECHNICAL METHODS OF ORE ANALYSIS. By Albert H. Low. New York: John Wiley and Sons, Inc. London: Chapman and Hall, Ltd. Pp. 348. 17s. 6d.

The Calendar

May		
7	Institution of Rubber Industry: "The Use of Rubber Products as Dielectrics."	London.
7	Society of Chemical Industry (London Section): Annual Meeting. 8 p.m.	Engineers' Club, 39 Coventry Street, London.
8	University of London: "The Electric Charge of Colloids." Dr. B. R. Kruyt. 5 p.m.	Department of Chemistry, University College, London.
8	Institution of Petroleum Technologists: General Meeting. 5.30 p.m.	John Street, Adelphi, London, W.C.2.
9	Royal Society of Arts: "Recent Developments in Surface Combustion." Dr. W. A. Bone. 8 p.m.	John Street, Adelphi, London, W.C.2.
10	Chemical Society: Baeyer Memorial Lecture by W. H. Perkin. 8 p.m.	Institution of Mechanical Engineers, London.
10	Royal Society: Papers by Professor A. Fowler, Sir R. Robertson, W. E. Garner, H. S. Hele Shaw, and F. W. Aston. 4.30 p.m.	Burlington House, Piccadilly, London, W.1.
11	Royal Institution of Great Britain: "Gaseous Combustion at High Pressures." Dr. W. A. Bone. 9 p.m.	Albemarle Street, Piccadilly, London, W.1.
16	Oil and Colour Chemists' Association: Annual Dinner. 7.45 p.m.	Holborn Restaurant, London, W.C.1.

Accuracy in Volumetric Analysis

By R. R. W.

In this article the writer gives details of some simple precautions which may be taken to improve the accuracy of simple titrations, particularly in alkalimetry.

IN most technical laboratories, volumetric analysis plays the chief part in the routine work, but is very commonly supposed to be less accurate than gravimetric work. Indeed, the general idea in volumetry is to be satisfied if titrations check each other to within one drop, and to pass as good enough results which are within two or three drops. In many cases, however, such accuracy is easily exceeded, if a few simple precautions, taking little or no extra time, are observed. The accuracy which can be obtained in simple acidimetry and alkalimetry, if no interfering factors are present, is less than .01 cc. on a 50 cc. burette with normal solutions; .01 to .02 cc. with tenth-normal solutions; and for iodimetry with tenth-normal iodine titrations can easily be made to check to .01 cc.

The Making of Standard Solutions

It is generally recognised that for accurate work the standard solutions themselves must be above reproach, and frequently the making of these is for this reason left to the chief chemist. This is quite wrong in principle, for it is only by his ability to make standard solutions that the user can prove his ability to use them. Consequently, standard solutions should always be made by the user of them, and when made, the chief chemist should check them (by means of reference solutions kept under lock and key). Should he find them to be in error it is not good enough for him to correct them, he must find the cause of the error, for it is probable that the same error, whatever it may be, is influencing to a greater or less extent every result turned out by the particular analyst concerned.

Standard solutions should in general be made up in large quantities, as, if properly preserved, they retain their original strength indefinitely. Certainly, with normal acid or alkali no change need be feared in two or three years. Proper preservation entails that they should be kept in bottles with thoroughly tight stoppers in a clean place away from fumes, and that the bottles in which they are stored—usually Winchester quart bottles—shall have previously been in use for holding either similar solutions or strong acids. Fresh bottles should be looked on with suspicion, as something may be dissolved from the glass which will affect the strength of the solution. It is therefore advisable to make up at once at least a six months' supply of each solution (except, of course, when this amount would be too large to manipulate). A stoneware jar of appropriate capacity or a glass carboy is very convenient for the purpose. These large quantities may easily be mixed by a current of compressed air; this is easier than shaking, and a carboy is thoroughly mixed in fifteen minutes.

Standard Acids

It is slowly becoming more generally recognised that for alkalimetry—e.g., the estimation of ammonia in coke oven or gasworks laboratories—the correct acid to use is not sulphuric, as is recommended in the older text-books, but hydrochloric. This acid is perfectly stable except under conditions of boiling, and has several advantages of sulphuric acid.

(a) The presence of sulphates in solution "draws out" the end-point with methyl-orange; hence the charge is less distinctly observed with sulphuric acid.

(b) A solution of sulphuric acid can only be accurately standardised by one method, i.e., titration against pure sodium carbonate. If one attempts to check the method by weighing as barium sulphate, the results are invariably slightly too high. The apparently simple method of neutralising with excess of ammonia, evaporating to dryness and weighing the ammonium sulphate, is open to objections because, owing to the high solubility of ammonium sulphate, it is difficult to get off the last portions of water without the solution spurring; it is necessary also to break up the crystal mass (which is very hard) to be sure no water is present in the interior of the mass; and the ammonium sulphate produced always proves to contain a trace of free acid.

On the other hand, hydrochloric acid may very conveniently be checked either by pure sodium carbonate, by Iceland spar (pure calcium carbonate), or by converting to silver chloride and weighing as such. All three methods will give exactly the same result, and of the three the Iceland spar method is the most convenient. A clean piece of Iceland spar (about 10 gms.) is washed with distilled water and dried, weighed, and placed in 50 cc. of the acid to be standardised. It is then allowed to stand overnight (preferably in a warm place), and in the morning a drop of methyl orange solution added. If this is turned yellow nothing more remains to be done except to pick out the crystal with the fingers, wash it with a little distilled water, dry it in the oven, and re-weigh. The loss in weight shows the strength of the acid. 50 cc. of normal acid will dissolve 2.5030 gms. Selected pieces of Iceland spar without flaws may be relied on to be pure calcium carbonate, and require no special treatment. Sodium carbonate frequently contains traces of impurities, always requires to be freshly dried, and unless carefully made by the analyst himself from the purest bicarbonate (previously tested for chlorides and sulphates) by heating this to 270° C., can never be relied on not to contain traces of either caustic soda or bicarbonate.

The Burette

It goes without saying that the burette must, for accurate work, be scrupulously clean. If a solution of chromic and sulphuric acid is allowed to stand overnight in the burette all the grease is dissolved, but a better method, not often mentioned by the text-books, is to wash out the burette with a little benzol, any quality almost will do, even crude benzol, and then with strong sulphuric acid. The burette is finally rinsed several times with distilled water to remove the acid. By this means the dirtiest burette is easily cleaned in five minutes. After cleaning, the burette should never be dried by alcohol and ether, as these reagents almost invariably leave the surface of the burette slightly repellant to water, as if a trace of grease were there. The burette must be rinsed two or three times with the solution to be used before being filled.

The method of running the solution from the burette is exceedingly important. The common practice of running out the solution as rapidly as possible and then allowing a minute to elapse before reading the burette may lead to erroneous results. If the time of waiting is extended to five minutes the results will almost invariably be inaccurate. For if the rate of drainage in a burette be observed, it will be seen that while the first thirty seconds shows a considerable drainage, and that after one minute the reading is apparently constant, drainage starts again after two or three minutes, and at five minutes the reading is changing fairly rapidly. It is not constant until half an hour has elapsed.

The correct method of using the burette is to regulate the tap so that the rate of flow is such that the surface of the liquid travels not more than 1 cm. per second. In this way the whole burette will be emptied in about one minute, and it is unnecessary to wait before reading it. On the other hand, the reading does not change in the least, even with half-an-hour's draining. It therefore follows that a burette delivers a larger quantity of liquid by this method than by running down rapidly and waiting one minute for the reading. The difference may be as much as .1 cc.

Reading the Burette

Floats are a snare and delusion. The best method is to have burettes with each complete cc. mark forming a complete ring round the tube. Each tenth of a cc. may be marked by a line continuing over halfway round, but this is hardly necessary. In any case, when the ring of any mark appears as a straight line (the back being covered by the front) the eye is at the correct level for reading at that mark. With burettes of this type it is easy to set the liquid to any mark with an error of

much less than .01 cc., and to read the liquid between two marks after a little practice with an error not greater than .01 cc.

Standardising the Burette

In order to test one's accuracy of reading, and cleaning the burette, and at the same time to standardise it, the burette should be filled with distilled water at a known temperature (the temperature of the room), and successive amounts of exactly 5.00 cc. run out into a weighed vessel, such as a weighing-bottle. In general it will be found that the markings on the burette are not exactly correct, and if so a table of corrections must be drawn up for use with the burette. It is necessary to check the results by filling up a second time and starting again, and provided the burette is clean and the readings accurate, the second set of weighings will differ from the first by not more than .005 gm. If this is not the case, the experiment should be repeated until checks can be obtained every time. In all probability the fault will be either with the burette not being clean (even though to the eye it may appear so) or to a trace of oil in the distilled water having the same effect. This method is (in the writer's opinion) better than the Ostwald pipette, and gives the user a much greater confidence in the burette when he finds that he can draw off 50 cc. with an error of not more than .005 gm.

The Titration

For really accurate work it is necessary to observe the temperature of the solution being used, and to apply appropriate corrections for this. As an example, it may be mentioned that 50 cc. of normal hydrochloric acid at 20° C. will contract by .058 cc. in cooling to 15° C. At the end of the titration it is necessary to take fractions of a drop from the end of the burette by touching the end with the titration flask and washing them into the liquid with a little distilled water. The end-point with methyl orange requires a little practice, but once that has been obtained is very accurate indeed. The titration should always be taken in the same direction for accuracy: viz., from pink to yellow, and not *vice versa*. The disappearance of the last trace of pink from the solution is very distinct, and ample warning is given of the approach of the end-point by a gradual change from a bright pink to a colour usually described in the text-books as brownish. If the titration is taken from yellow to pink one is bound to overstep the end-point; for it must be remembered that methyl orange in distilled water is yellow, not "neutral tint," and exactly the same colour as in dilute caustic soda solutions. Consequently titrations must be continued to the full yellow colour, but it must only just be attained as further addition of alkali produces no further change.

It is necessary to note that as little methyl orange as possible should be used—in fact, just enough to give a pale pink colour. As the neutralisation proceeds the pink becomes fainter and fainter, and just before the end-point, or at the end-point, it is best to add one more drop of dilute methyl orange solution, to see if it restores the pink colour.

It is very helpful where possible not to put the indicator into the solution until the end-point is approaching, as the bright pink of very acid methyl orange tires the nerves of the eye and renders it much less sensitive to the final change. For the same reason, the titration should be done on a large slab of opal glass in a good light, and the stock bottle of methyl orange should be out of the eye's range. There should be on the slab and in reach of the eye two flasks exactly similar to the one in which the titration is being done, and containing the same amount of methyl orange and the same amount of distilled water. Into one of them a few bubbles of CO₂ are passed, until the colour of the methyl orange is affected. These two flasks then show quite plainly the approach of the end-point and its final state of pure yellow. After a little practice these comparison flasks are usually found unnecessary. Daylight is best for the titration; many people, however, find it quite easy to work by the light of a half-watt electric lamp (shaded from the eyes). Those using methyl orange constantly appear able to get perfectly accurate results in the ordinary light of a metal filament lamp, but it is undoubtedly more difficult for people not using it constantly.

With tenth-normal solutions agreement (without interfering substances) can only be expected to about .02 cc. For these solutions it is often convenient to use methyl red as an indicator which gives a much more violent colour change than methyl orange. In this case the end-point is not pure yellow, but a

distinct brown. Many people, however, find that after a careful titration with methyl orange, if the liquid is tested by adding methyl red (which quite overshadows the tint of the methyl orange) they always have come to exactly the same point on the methyl red scale: viz., brown with a trace of pink.

There are, of course, many occasions on which substances occur in the solution which mask the end-point to a very great extent; these, of course, cannot be very accurately titrated; but with clean solutions, such as an estimation of the strength of various acids or an estimation of ammonia, it is quite possible to keep the errors to very low limits. As the precautions prescribed are almost entirely changes of arrangement, they do not occupy any more time than would be taken by a rough titration correct to 1 drop (.05 to .08 cc.).

Society of Chemical Industry

Papers before the Nottingham Section

At a meeting held on Wednesday, April 25, the annual report and balance sheet was read and the election of officers for the ensuing year concluded as follows: Chairman, Mr. J. M. Wilkie; vice-chairmen, Messrs. S. F. Burford and H. D. Redmond; hon. treasurer, Mr. S. J. Pentecost; hon. secretary, Dr. E. B. R. Prideaux.

A paper by Dr. J. B. Firth and Mr. J. Higson was read by the latter. It was pointed out in the paper that the action of sodium hyposulphite on cupric chloride in aqueous solution gave different products when the concentration of the hyposulphite and the temperature were varied. At lower concentrations and temperatures the precipitate was white and consisted mainly of cuprous chloride. At higher concentrations and temperatures this soon darkened, or the precipitate came down black in the first place and then contained cuprous sulphide. Under certain conditions almost pure copper was precipitated. Equations and tables were given which explained these results.

Adsorption Activity of Carbon

The second paper by Dr. J. B. Firth dealt with the adsorption activity of carbon. The power of taking up large quantities of gases and of removing colouring matters, etc., from solution was shown to vary widely; according to the treatment which the carbon had received. The majority of the active carbons of industry were obtained by carbonising the material, which was usually of vegetable origin, in contact with some material such as milk of lime, soluble chlorides, sulphates, etc. Some experiments were described in which sugar charcoal was prepared with and without admixture with zinc salts and heated to different temperatures for different times. The activity was tested by allowing it to absorb iodine from a dry chloroform solution, and was found to be greater after strong heating, to be increased by the addition of zinc salts in the manner mentioned above, and also by carbonisation on a support of kieselguhr. The catalytic activity of some of the heat-treated samples was also tested by the decomposition of hydrogen peroxide, and the order of activity was found to be the same. Some experiments also showed that activity diminished after keeping for long periods, and theories were put forward which connected increased activity with diminished complexity of the carbon molecule.

Contamination of Bottled Substances

Mr. Richmond described a remarkable case of contamination of potassium carbonate by lead and arsenic, apparently derived from the lead glass bottle in which they had been stored. The stocks of potassium carbonate which had been continually put in the bottle for years had all been traced and found to comply with the requirements of the *Pharmacopœia Britannica*, and various other evidence showed that corrosion of the bottle had taken place. The glass of the bottle had been analysed by Mr. Wilkie, who in a succeeding paper gave details of the analysis.

Mr. Coad Prior characterised this as a most remarkable glass; it was high, both in lead and in alkalies, and contained 0.38 per cent. of arsenic. He gave a short account of the nature of the glass bottles which were now being supplied to the trade and concluded by expressing a wish that the chemical industry should lay down a definite standard, specifying the maximum limit for alkalies (not more than 16 per cent.) and the minimum limit for lime (10 per cent.) which should be permitted.

Reviews

VITAL FACTORS OF FOODS: VITAMINS AND NUTRITION. By CARLETON ELLIS and ANNIE LOUISE MACLEOD. London: Chapman and Hall, Ltd. 1923. Pp. xiii., 391. 25s.

This is the most comprehensive survey that has yet appeared in English on this important subject. The book is written in an interesting manner, and is replete with full references to the voluminous literature. In this respect it is an indispensable work of reference to all concerned with the subject of food from the vitamin standpoint. The authors have not been content to produce a catalogue, but have dealt with their material in a critical and helpful way.

The book deals almost exclusively with our knowledge of vitamins, with the exception of one chapter on "Dietary Factors other than Vitamins," in which mineral salts and the amino-acid quality of proteins are briefly considered. The reviewer would suggest that much of the matter in this short chapter might well be omitted or relegated to the "Introduction" or to the chapter on "Experimental Methods."

On the vitamins themselves, the volume is exhaustive in its treatment, and is admirable in every respect. The various deficiency diseases are discussed at length in a series of important chapters. In "Vitamins for the Baby" and "What to Eat from the Vitamin Standpoint" there are chapters which will be valuable to those seeking guidance in connection with child welfare, hospital work, and home requirements. There is a useful appendix showing the distribution of the vitamins in foods, and full indexes conclude a thoroughly masterly treatise which can be confidently recommended to all who have to take these new factors in nutrition into consideration. Numerous charts and photographs on art paper illustrate the book and add greatly to its value, and it seems destined to become the standard work on its subject. A few unimportant errors have been noted, and on page 133 the last three lines of the text are in the wrong order. The heading "Distribution of Vitamin C.—Animal Products" has been accidentally omitted from page 330. The work of the two Mellanby's does not appear to be differentiated by the authors.

A. R. T.

VAT COLOURS. By J. F. THORPE and C. K. INGOLD. London: Longmans, Green and Co. Pp. 491. 16s.

There is no doubt that the production of an adequate range of the increasingly important indigoid and anthraquinone vat dyestuffs, perhaps the most valuable of all colours, comprises one of the chief problems confronting British dyestuff manufacturers in their efforts to re-establish the industry in this country. A compilation which treats exhaustively of the chemistry of these substances, especially in view of the scattered nature of existing information, is therefore an important addition to chemical literature.

The volume under review consists of four sections, the first of which comprises chapters concerning natural indigo, synthetic indigo, its substitution products and analogues. Part II is devoted to an account of anthraquinone, substituted anthraquinones, and their chain and fused ring derivatives. Parts III and IV deal respectively with miscellaneous vat dyestuffs, and the preparation of the more important intermediates and colours of these series.

As the reviewer has hinted above, the book is concerned primarily with the chemistry of the vat colours, and this is perhaps its outstanding characteristic, as distinguished from a volume containing merely a mass of technological detail, though the latter aspect has not been ignored. The authors have, moreover, avoided the all too frequent tendency towards the production of a mere catalogue of substances, their work being undeniably "readable."

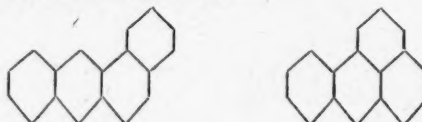
This desirable attribute is perhaps due to three principal features. In the first place, considerable space is devoted to historical records, such as the excellent chapters on Tyrian purple and natural indigo, as well as to the history of the more important syntheses. Comprehensive accounts are thus given of the various preparations of indigo, and of the work on Indanthrene and Flavanthrene of Scholl and his collaborators, to instance one or two examples.

Secondly, as the several types of substances are considered, the essential chemical principles involved in their methods of preparation, and the structural significance of their properties, are clearly emphasised, the subsequent detailing of individual

members of the groups serving admirably as illustrations. The various changes are set forth graphically with full structural formulæ. The book should thus appeal to organic chemists generally, and should be fruitful in suggesting new lines of development in widely varying fields of research.

In the third place, the study of what may appear at first sight to be a somewhat disordered multitude of anthraquinone derivatives is considerably simplified by a very logical system of classification. In this connection, mention may be made of the authors' effort to rationalise the existing chaotic methods of nomenclature.

Dealing with the fused ring compounds, they have drawn a simple distinction between fused ring systems containing only two common carbon atoms and those containing more than two such common atoms thus:—



and have adopted therewith two systems of nomenclature, which, without introducing any novelty, are at any rate of perfectly definite application, and of unmistakable meaning. The preparations in Part IV, dealing with thirty-two intermediates and nineteen dyestuffs, form a useful feature, though in some cases the working details are rather meagre and the original references are not too obviously accessible.

The book is fairly free from typographical errors, although a few unfortunate misrepresentations and interchanges of graphical formulæ have crept in. Name and subject indexes are provided.

S. E.

THE DESTRUCTIVE DISTILLATION OF WOOD. By H. M. BUNBURY. London: Benn Brothers, Ltd. Pp. 320. 35s.

Very early in the war the need for acetone in the manufacture of cordite and of acetone derivatives for preparing dope for aeroplane fabrics far exceeded the supply. Steps were taken to remedy this serious defect, first, by altering the composition of nitrocellulose so that other solvents than acetone could be used in its conversion into cordite; and, second, by increasing the number and efficiency of the plants in which acetone was produced. As a result the wood distillation process came into greater prominence than it had enjoyed hitherto.

Mr. Bunbury is to be congratulated on the writing of a book dealing with the destructive distillation of wood, for, to the reviewer's knowledge, there is no book in the English language which deals adequately with the subject and collates all the different factors which bear on its many problems. A sense of modesty, perhaps, has prevented the author from mentioning that he was engaged in the manufacture of nitrocellulose and in the destructive distillation of wood during the war. His book, therefore, is written with the authority born of experience.

The volume is broadly divisible into four sections—(1) physical and chemical properties of wood, (2) general views on destructive distillation, (3) modern processes of wood distillation, and (4) utilisation of waste products. Which of these is the most important depends entirely on the particular interests of the reader. With them all the author has dealt very fully, realising, probably, that the practical man must be well acquainted with all the phases of his subject. It is accepted, of course, that in any book the story cannot be told in all its most minute details, but Mr. Bunbury has given a good selection of the modern theories and processes, illustrated by a long series of diagrams and tables, and supplemented by many references, which should prove a sound basis on which to found a greater knowledge. The book is, indeed, better than an ordinary text-book, for it will find a place among the many reference books with which the chemical technologist is now provided.

It is a matter for speculation how far wood distillation will advance in this country. Our wood resources are not as good as those of other countries, and the outlets for the products perhaps not so advantageous. But it is the opinion of many people of judgment that the process can be made to pay, especially if serious consideration be given to the utilisation of waste products—a subject to which the author

devotes great attention. It is to be hoped that the book will stimulate interest in an industry which can be equally useful and remunerative in peace as well as in war.

One cannot close this review without paying a high tribute to the printers and publishers who have excelled in their part of the work. It would be well if all standard books could be produced with such clearness and good style.

C.

SECOND YEAR COLLEGE CHEMISTRY AND MANUAL OF LABORATORY EXERCISES. By W. H. CHAPIN. London: Chapman and Hall, Ltd. New York: Wiley and Sons. Pp. 175. 7s. 6d.

The two companion volumes on theoretical and practical chemistry by Professor Chapin represent a second year course for college students. Without a knowledge of the contents of the preceding volumes it is difficult to judge how far the elementary facts of chemistry have been developed and the ground prepared for the more advanced ideas contained in these two books. Assuming, however, that the fundamental portions have been adequately treated, we have nothing but praise for this second year course. It might possibly be objected that modern theories are too largely in evidence, but there can be no question that the present views on atomic structure and the development of the facts which have led up to them should not only afford matter of entrancing interest to the student, but tend rather to simplify than complicate many aspects of chemistry.

The descriptions are written in clear and simple language, and each chapter concludes with a number of exercises and problems by which the student may voluntarily or otherwise test his knowledge. It seems curious that where there is so much that is modern and up to date, the important work of Aston on Isotopes should be omitted. It appears to the writer that the section on p. 81, on "Change of Valence," is misleading, or at least unconvincing as it stands, and might well be left to the subsequent section on "The Electronic Conception of Valence," where it is more clearly expanded.

The practical part of the course is intended to be followed in the laboratory *pari passu* with the theoretical part, and consists of a series of simple experiments, some of them of a very elementary kind, but mostly well chosen and carefully described and illustrated. They have, according to the author, been carefully "tested out," and by "careful following of directions will insure good results."

J. B. C.

THE RECOVERY OF VOLATILE SOLVENTS. By CLARK SHOVE ROBINSON. New York: The Chemical Catalog Co. Pp. 188.

This is essentially a book that is of practical use to chemical engineers. The author apologises in his preface for dealing in the earlier chapters with some of the elementary principles of chemical engineering. I think no apology is needed for this, as the information given is not only of use to the chemical manufacturer who may be looking into the subject of the recovery of volatile solvents, but it is also useful to the chemical engineer himself to refresh his memory on certain formulae which it is difficult to carry in one's mind.

The book is full of both interesting and very practical data, and covers the most up-to-date methods for dealing with this recovery problem. Patrick's equation and the curves by Miller on the adsorption of mixed gases are of great value. There is some very interesting matter under the section relating to the forced circulation of gases. It would have been perhaps more useful, as far as British readers are concerned, if the book had given illustrations of British as well as American plant; but, apart from this, the book is one that should be added to the technical library of all chemical engineers and chemical manufacturers.

The abstract of literature at the close of the book is one of the most complete abstracts on this subject, and is in itself of utmost value. If similar abstracts—as well compiled—were added to all books dealing with specific subjects they would considerably enhance their value.

Printing errors are particularly few in this book, but in any new edition the following figure should be corrected on page 105

" $A = 10 \times \pi \left(\frac{1}{12} \right)$ " should read

" $A = 10 \times \pi \left(\frac{2}{12} \right)$."

J. ARTHUR REAVELL.

A TESTED METHOD OF LABORATORY ORGANISATION. By SEYMOUR PILE, M.A., and R. G. JOHNSTON. London: H. F. and G. Witherby, 326, High Holborn. Pp. 98 + xx. 7s. 6d.

This book gives an account of the system introduced by the authors into an analytical laboratory, which has been tested and found to give increased efficiency in regard to accuracy of results and great economy of working, both in time and expense. Laboratory organisation being largely a matter of attention to detail, the close study of this little book is to be recommended to anyone who is considering either the building or re-organisation of a laboratory, whether for research or routine testing work. Many of the suggestions are very valuable, and not the less useful in some cases for being obvious. A few illustrations and specimen work sheets are included.

SURFACE TENSION AND SURFACE ENERGY. By R. S. WILLOWS, M.A., D.Sc., and E. HATSCHEK. London: J. and A. Churchill. Pp. 134. 6s. 6d.

This is the third edition of this popular text-book, and it has been enlarged slightly and brought up to date, with the addition of matter on the theory of lubrication. Chemists would do well not to forget the phenomena of surface tension and surface energy upon which such important questions as absorption or lubrication depend. The scope of this book is quite comprehensive and mathematics are only included to the smallest extent compatible with accurate argument.

ELEMENTS OF GLASS-BLOWING. By H. P. WARAN, M.A., Ph.D. (Cantab), F.Inst.P. London: G. Bell and Sons, Ltd. Pp. 114. 2s. 4d.

It has often been remarked that the laboratory chemist, however practical he may be in other directions, is often lamentably ignorant of glass working, which is left to the "man." A close study of this clearly written little book should do something to correct this state of things. The book covers the simplest work, such as cutting glass tubes, and includes hints for producing complicated apparatus.

Structure of Alloys

THE thirteenth annual May lecture of the Institute of Metals was delivered on Wednesday, May 2, at Storey's Gate, Westminster, by Dr. W. Rosenhain, F.R.S., of the National Physical Laboratory, on "The Structure of Alloys."

Referring to the great accumulation of facts in regard to the properties and microstructure of alloys which have been forthcoming in recent years, the lecturer said that the time had arrived when it was desirable that there should be a general theory that would link together the mass of facts into a homogeneous whole. Such a theory he attempted to put forward, basing it upon the intimate knowledge of crystal structure which had recently been acquired by means of the application of X-rays to the study of the arrangement of atoms in crystals. The crystal structures found in pure metals became modified in the case of alloys, particularly in those called solid solutions, where the atom of the alloying element entered into the structure of the crystal and produced in it certain minute changes. With regard to such changes the lecturer put forward two simple principles, and was then able to show a striking series of inferences from his theory, which accorded closely with a large number of experimental facts. Connections between various series of properties in metals and their alloys were established which had not formerly been recognised, such as the relation between hardness and alloying power. Especially important was the connection between the minute distortion of crystal structure which occurred in alloys and their behaviour on melting and freezing, while such phenomena as plasticity, diffusion and others fell easily into line with the same type of explanation. Most important of all, perhaps, was the fact that this new theory of alloy structure afforded a ready explanation of the electrical properties of metals and alloys and the changes of these properties when the metal was heated or cooled. These explanations covered the mysterious phenomena of superconductivity found in many metals when cooled nearly to the absolute zero of temperature.

Making Colour Makers

To the Editor of THE CHEMICAL AGE.

SIR,—Professor Perkin of Leeds University has just announced that no fewer than forty-seven students have gone out this year from the Departments of Colour Chemistry and Dyeing, of which he is the head, to take up positions with colour makers, wool dyers, cotton dyers, calico printers, artificial silk manufacturers, and in other industries. It is heartening news to those who believe, as I do, that British industry depends to-day, and is in the future going to depend more and more, upon the pooling of scientific knowledge won at our Universities and the technical ability which can be acquired only from large-scale production.

In these circumstances it is not quite clear on what Professor Perkin bases his fear that, even yet, the artificial dyestuffs industry might one day become "moribund" in this country. At the present moment both colour makers and colour users are practically unanimous in their determination that a national dyestuffs industry shall be maintained and developed in Great Britain; differences between them there are, but they are differences regarding not the end to be attained, but the means to attain it.

There has been a considerable amount of prejudice to be overcome in securing the widest use of British-made dyes; but that is an inherent tendency which is gradually and successfully being lived down by British makers. Makers and users realise that they must work hand in hand, and it is an excellent augury for a continuance of amicable feeling that during the Ruhr crisis no attempt has been made to increase prices. Before the war we depended on Germany for 80 per cent. of our dyestuffs; to-day we can supply more than 80 per cent. of the dyes required by British colour users. It is a considerable achievement, and it gives promise in the future of offering many more than Professor Perkin's estimate of twenty openings a year to students qualified in colour chemistry.—Yours, etc.,

W. J. U. WOOLCOCK.

Association of British Chemical Manufacturers,
166, Piccadilly, London, W.1. April 27, 1923.

The Nitrogen Industry

To the Editor of THE CHEMICAL AGE.

SIR,—I have just returned to town, and read with much interest the appreciative and informative review by Mr. Kilburn Scott of the book written by Dr. Parker and myself. I feel that one point should be cleared up. Mr. Scott accuses us of ignorance of his work. For my own part, charges of ignorance are usually so well founded as to leave me unmoved, but in this case Mr. Scott is also involved, and as he may have been—as he had a perfect right to be—slightly hurt by our silence, I feel that we owe him a little explanation.

In the autumn of 1916, as I was enjoying a quiet pipe aboard a barge on the Somme, and lazily watching the firing of railway guns in our rear, an urgent telegram from the War Office was delivered by an orderly who had rowed up with it, and in this I was required to report at once in London; for what purpose, of course, no reason was given. I left at once for Amiens, a French field kitchen on the opposite bank just being hit and blown up, scattering fragrant steaming soup, as a departing lustration. On reporting at the War Office—I had a wash and shave first—I found, as I expected, that nothing was known of me, but I was assured that it was probably not a matter of my cashiering as an officer, and I was advised to drop in again in a few days. To cut the story short, I afterwards saw Dr. J. A. Harker, who offered me a job to do research on the oxidation of ammonia. I believe my name had been mentioned to him by the late Dr. Greenwood. I knew nothing about this process, but I offered to try some experiments. This was in September, 1916. In January, 1917, with the help of Dr. Parker, who had been invalided home from the Somme shortly before, I was oxidising ammonia; it proved very easy in comparison with other things I have had to do.

Before this I thought it useful to try and learn something about the business, and I naturally went to Manchester, to my old university. There I was advised to go and see a new

arc process devised by Mr. Kilburn Scott. I did so, and saw a small experimental furnace, which was not working. Mr. Howles gave me a good deal of information, and he was very enthusiastic. On my return to London I brought the matter to the notice of my chiefs, who, naturally, knew all about it. I know that this process and others were carefully considered, but it was decided by the committee of experts that the arc process was "off" so far as England was concerned. Their reasons are given in the Report of the Nitrogen Products Committee. Since then I followed the progress of this and other arc processes, and I gave my opinion of these, including Mr. Scott's, as far as I was then able to judge, in my article on the "Utilisation of Atmospheric Nitrogen," in the new edition of Thorpe's *Dictionary*. The difficulty Dr. Parker and I met with was that, with the exception of the process discussed in our book, no figures for technical operation were available. In one case (not Mr. Scott's) the technical trials were unsatisfactory.

I wish to emphasise that in what I have said there is not the slightest disparagement of Mr. Scott's process. I reported in 1916 that I considered it highly ingenious, and that it should be watched, and I have not since changed my mind. I still hope to see it working in some part of the Empire where power is cheap.

The *Experimental Report* of the Nitrogen Products Committee was to be published. I saw it in proof over a year ago, but I was told later that the technical interests objected to its publication, and it will probably not appear. This is not such a loss as might be supposed, as the other nations are publishing most of the work done in this direction, which was along similar lines. Only personal reputations are involved, and the matter is perhaps not really serious.—Yours, etc.,

J. R. PARTINGTON.

East London College, April 27.

"Chemist" and "Pharmacist"

To the Editor of THE CHEMICAL AGE.

SIR,—The Council of the British Association of Chemists wishes to endorse fully through your columns the proposals of Dr. E. F. Armstrong, set forth in his letter of April 9, for the calling of a round table conference to discuss with the pharmacists the possibility of agreement over the future employment of the term "chemist."

The question of the education of the public mind in the correct signification of the terms "chemist" and "pharmacist" is one which has received the continuous attention of this Association, and it is felt that the calling together of such a conference as Dr. Armstrong proposes, representative of the interests concerned, would, with the active support of the Press, tend in large measure to dissipate the confusion of thought at present existing in the mind of the general public.

If Dr. Armstrong will undertake further steps in the matter, we feel that, in addition to securing the immediate support of this Association, he will carry with him the whole of the other chemical societies.—Yours faithfully, for the British Association of Chemists.

HERBERT LEVINSTEIN, President.
J. W. HINCHLEY, Past President.
WM. E. KAY, Chairman of Council.
I. BOODSON, Hon. General Secretary.

Bedford House, 108, Baker Street, W.1.

May 2, 1923.

Borax Prices

To the Editor of THE CHEMICAL AGE.

SIR,—With reference to the regular market reports in your journal, we may say that we have for some time past been offering "Three Elephant" brand borax throughout the United Kingdom at the following prices:—Commercial granulated borax, £27 per ton; commercial powdered borax, £28 per ton; which figures are £1 per ton below the English makers' prices. If it is possible for you to give publicity to these facts we shall esteem it a favour.—Yours, etc.,

C. CHRISTOPHERSON AND CO.

6, Lloyd's Avenue, E.C.3.
May 1.

Income Tax Repayments

To the Editor of THE CHEMICAL AGE.

SIR,—The many taxpayers who are entitled to repayment of tax should proceed to formulate their claims at once, now that another fiscal year (to April 5, 1923) has expired. If the Chancellor's Budget proposals are adopted it will be possible later to claim for six years past, but in any case claims may now be made for the years 1920/21, 1921/22 and 1922/23.

Some of the chief grounds of claim, shortly stated, are as follows:—(1) Personal allowance of £135 (single) or £225 (married); (2) wife allowance to £45 if earning income (even though in husband's business); (3) relief on earned income; (4) life assurance premiums at 2s. 6d. to 6s. per £; (5) children allowance, first £36, each subsequent £27; (6) housekeeper or widowed mother allowance of £45; (7) dependent relative allowance of £25; (8) half rate on first £225 taxable income; (9) interest on bank overdrafts and stockbroker's advances; (10) repairs, maintenance, etc., of property.—Yours, etc.,
67/68, Cheapside, London, E.C.2. W. R. FAIRBROTHER.

Modern Methods of Fur Dyeing

Paper by Mr. L. G. Lawrie

In a paper before the London section of the Society of Dyers and Colourists, on Thursday, April 26, Mr. L. G. LAWRIE said that although the art of dyeing furs had been practised since the earliest of historical times, only recently had any notable progress in the use of fur bases been made. In 1888 E. Erdman patented the use of paraphenylenediamine and similar compounds for the dyeing of hair, and it was soon realised that these substances could also be used for fur dyeing, and about 1895 the Berlin Aniline Company introduced the first of their range of Ursol colours. These fur bases were principally diamines, amido phenols, diphenylamine derivatives, etc., which possessed the property of forming coloured insoluble compounds in the presence of oxidising agents.

Considering briefly the preliminary operations to which the fur was subjected, as these often profoundly modified the subsequent dyeing properties, Mr. Lawrie said that the skins came into the market as either "Flat" skins or "Cased" skins, according to the way in which they had been removed from the animal by the trapper. The skins were stretched out and allowed to dry and were sent to the market in this form. This drying process, although it hardened the skin, arrested the decomposition which would otherwise take place.

Tannage

Before the furs could be dyed they had to be dressed. The principal operation was a tannage to convert the skin into a leather which should be soft, durable, and resistant to water. One of the cheapest and easiest methods of tannage was by treating the skins with a mixture of common salt and sulphuric acid. This was not a very satisfactory method, and was used for those skins which were to be dressed only, as they would not stand a subsequent dyeing operation. Another method was by treating the skins with a solution of alum and salt, which gave a much better tannage, the skins having more stretch and elasticity. The chemicals were removed to a certain extent by soaking in water so that if the skins were to be dyed a further tannage treatment was required. The skins could also be chrome-tanned in a solution of chrome alum and soda when a good tannage was produced which was so resistant to water that the skins could be dyed at a high temperature without the leather being affected. The oldest and most important tannage, however, was the oil tan. To produce this tannage, seal oil was well rubbed into the skins on the flesh side, and they were then folded up flesh side to flesh side and put into a trough and "tramped" by men with their bare feet, or they could be put into a tramping machine having two wooden hammers, which pounded the skins and worked the oil into them. After impregnation the furs were allowed to "heat" and care must be taken that they did not reach too high a temperature (30°C.).

Killing and Mordanting

Furs to be dyed were first thoroughly wet out in warm water in order to enable them to absorb the various chemicals used. After wetting-out they were "killed"—a most important operation, on the efficiency of which depended the

whole success of the actual dyeing itself. In killing, the hair or fur was treated with alkaline agents of varying severity according to the nature of the hair. The reason for this was that hair was very resistant to the action of the dye solutions, and without an alkaline treatment it would not take up the dyestuff evenly, this being specially noticeable with the tips of the hair. The furs could be killed by either steeping them in a dilute solution of ammonia, soda, lime, or caustic soda, or stronger solutions of these alkalis could be brushed on to the tips of the fur, allowed to dry, and finally brushed off again.

After killing, practically all furs, except those to be dyed very light shades, were subjected to a mordanting process which consisted in depositing metallic salts on the fur. This mordanting gave deeper and faster shades on unmordanted fur, and in addition variations in shade were obtained by the use of different mordants or by using mixed mordants. The metallic salts usually employed were copper sulphate, sodium bichromate, ferrous sulphate, and alum, the furs being steeped in their cold solutions overnight. After mordanting the furs were washed and entered into the dyebath.

"Dip" Dyeing and "Brush" Dyeing

Furs were dyed by impregnating them with a solution of the fur base, together with hydrogen peroxide, and usually a little ammonia or a little acetic acid. There were two main methods of dyeing—"Dip" dyeing, when the skins were completely immersed in the dyebath, and "Brush" dyeing, when the skins were brushed with the dye solution on to the hair.

With "dip" dyeing the necessary amount of fur base was weighed out and dissolved in boiling water, and the solution added to the dyebath, which was made slightly alkaline, acid, or neutral according to the base used and the shade desired. An amount of hydrogen peroxide (12 vol.) 12-15 times that of the fur base was then added to the bath, and the mordanted furs entered cold or lukewarm. The furs were left in this solution for anything from 6 to 12 hours according to the depth of shade required. After dyeing they were thoroughly washed to remove any unaltered fur base.

Furs were also often dyed by brushing on solutions of the fur base and hydrogen peroxide. This method of dyeing was sometimes necessary owing to the fragility of some furs which could not stand long immersion in the dyebath, but more often they were brush-dyed in order to colour the tips of the hair only or to colour them differently after the whole skin has been dyed a ground shade. Several applications of the brush might be required, the fur being allowed to dry between each application.

British Fur Bases

The following were the shades given with the principal fur bases of the British Dyestuffs Corporation:—Fur Base I.—Paraphenylenediamine was used principally for black shades, and was dyed from a neutral bath on a copper or copper and iron mordant. The self-shade of this base, which was a little on the red side, could be made bluer by using a mixture of Fur Base I. and X. Fur Base III. gave reddish-brown shades, and was usually dyed on a chrome mordant. It was used considerably for the production of browns in conjunction with Fur Base I. Fur Base VI. gave yellowish-brown shades, and was used principally as a shading colour. Fur Base VIII. on iron or copper mordants gave light or dark greys from a slightly alkaline bath. It could be mixed with other bases to produce varying shades of grey. Fur Base XI. gave greenish shades of grey on an iron mordant, and was dyed from a slightly acid bath.

After dyeing, the furs were subjected to a finishing process, which consisted of several treatments to improve the leather and to bring out the full beauty of the furs. The first operation was an application of some fatty substance to the flesh side of the fur to prevent the skins from drying up in a hard condition. Whale or seal oil could be used, but other fatty substances, such as egg-yolk, olive oil, castor-oil, etc., could be employed. After oiling the skins were drawn in all directions over a semi-circular knife, which gave the skins the maximum amount of stretch and caused them to become very pliable. After knifing the furs were drummed in a revolving cylindrical vessel containing hardwood sawdust, etc., which removed any superfluous dyestuff, cleaned the fur, and gave it a gloss and lustre. The furs were finally beaten, brushed, and combed, when they were ready for making up.

Position of the Chemical Industries of Russia

Post-war and Pre-war Conditions Compared

Mr. Boris Monsaroff, a Russian chemical engineer, contributes to "Canadian Chemistry and Metallurgy" a general survey of a situation upon which little has been said by competent engineers. As a chemical engineer who had a responsible position as a manufacturer under the former order, and who, until quite recently, was associated with the efforts of the present Government to bring about better industrial conditions, he has a personal knowledge of the subjects on which he writes. Mr. Monsaroff is at present in Canada, where he hopes to follow his profession as a chemical engineer.

ONE cannot say that before the war the Russian chemical industry stood on a high degree of development. In comparison to the territory of the Russian Empire and its natural resources and wealth, the development of chemical industry cannot be considered large. Yet it made, during the period of the last years previous to the war, some important steps toward more intensive growth, and the tendency was for further permanent development.

Agricultural chemistry was well developed. Russia was, and is now, an agricultural country, but the distribution of land among several classes of the population shows a balance more favourable to the large landowners. Among the latter there were a number of gentlemen, so-called "dvorianstvo," who had a great influence on the absolute government of the Tsar. In order to support this system and meet increasing deficits considerable attention was given to methods of scientific agriculture and allied chemical factories were established. Industries using agricultural products were definitely encouraged. In order to cover these deficits, the landlords began to establish chemical factories, connected with agriculture. Among these were sugar-refineries and distilleries. The economic and financial policy of the Russian Government was very favourable to an intensive development of these lines of chemical industry. The sugar industry was strictly regulated. The prices of sugar for internal consumption were controlled by the Government, and were on a very high level. The sugar destined for export was free of taxes, and in some cases the owners of factories obtained export premiums. That is the reason why Russian sugar has been sold on the foreign markets at much lower prices than at home. This policy made the sugar industry very profitable, and it increased enormously. In the year 1913 there were 240 factories, with a total production of 110,000,000 pounds of sugar, with a value amounting to 440,000,000 roubles (equal so \$220,000,000). The financial policy of Russia and the system of taxation was very favourable also to the development of distilleries. This policy had been based on the wine or alcohol monopoly. Almost 50 per cent. of the State budget, which had reached, in the year 1912, to 3½ million roubles (\$1,625,000,000), had been covered with money obtained from the State's sale of alcohol. It is obvious that by such means these industries should flourish.

The Pre-War Textile Industry

The textile industry in central Russia (district of Moscow and Jaroslav) stood also at very high degree of development. The latter was a consequence of the natural wealth of Russia as an agricultural country. The climatic conditions of central and north-west Russia are very favourable for industrial plants, such as flax. The raising of sheep of the highest grade was also very much extended in the south and in the central provinces of Russia. The textile industry had, therefore, a sufficient supply of raw materials; and all conditions necessary for a flourishing development of this line of industry were present. But the textile industry of central Russia suffered greatly from the competition of the textile industry of the district of Lodz, a town of Poland, which, before the war, belonged to Russia. The Russian Government always neglected the special needs of this line of industry, therefore the leaders of the textile industry at Marasoff, who did not belong to the governing class, and others, were strongly opposed to absolutism.

The Leather Industry

Other lines of chemical industry showed a permanent tendency to advance. The production of leather, which previously lay in the hands of small factories, where most primitive methods were applied, was improved. Some big factories, highly equipped, conforming with the requirements of modern technique, had been established in several towns in Russia, for instance, Shlenker, at Reditchev. Bark-tanning, even in small factories, was replaced by drum methods with

contracts. At the same time a large factory for the production of liquid tanning extracts was established at Kieff.

Pre-War Chemical Industries

The production of salts and acids stood also in a very high level of development. The concerns of Solvay in south, and Tentileff, at Petrograd, are well-known. The ceramic industry, and the production of glass, was very considerable.

The rubber industry satisfied all needs of the Russian market in rubber materials, and had a sufficient surplus for export. In the last few years before the war the development of the fertiliser industry and the production of phosphate greatly increased the production of sulphuric acid. Comparatively on a lower degree of development were the dyestuff and pharmaceutical industries, which suffered by the competition of German goods. This competition was a consequence of the commercial treaty, which existed between Russia and Germany previous to the world war.

The world war changed the general conditions of the chemical industry. The mobilisation of large masses of the agricultural population lowered agricultural production and chemical industries, dependent upon agriculture. The production of sugar was diminished, owing to the lack of sugar beets. The alcohol distilleries were closed in consequence of the Prohibition Act, issued at the beginning of the war. These lines of industry had to accede their places to other lines of chemical industry, which were necessary for the defence of the country. The metallurgical industry increased enormously. Some big factories began to produce the highest types of steel, for instance, high-speed steel, which, previous to the war, had not been produced in Russia. Also, the production of salts and acids made remarkable progress. In several parts new chemical factories were established. At Petrograd, for instance, a large factory for the production of calcium carbide was built. In the south of Russia new factories were established for the production of acids and salts of potassium and sodium. The dyestuff industry, which had been delivered of German competition, began work more successfully. The production of aniline dyestuffs was now possible in Russia. The production of industrial gases (nitrogen, oxygen and also poisonous gases for war purposes), went ahead rapidly. The organised forces of the State, for the purposes of defending the country, as, for instance, the War Industrial Committees, Union of Towns and Union of Semstvo, induced the other small factories, which had applied very simple and primitive methods of work, to improve their equipment and practise new methods. By such means progress was being made rapidly.

The Decay of Industry during the Revolution

Thus, at the beginning of the revolution, Russia had a well-developed chemical industry. The following events changed the situation: The revolution, which had broken out in February, 1917, weakened the energy of those leading the war, and diminished the buying power of the State and the public. Many chemical factories were forced to diminish their production. Among the workers, inspired with the idea of the Bolshevik programme, a movement for controlling the factories appeared. A hard struggle then took place between the workers and owners of the factories. The engineering societies, in order to save industry from destruction, did their best to bring peace to the struggling parties, but they could do nothing. The Russian engineer had no confidence in the workers in the factories. The engineer was considered as a representative of the capitalists, and therefore as no friend of the working class. The appeal of the engineering societies to the owners of factories gave no results. In an extremely short time the whole industrial equipment of the country was paralysed and chaotic conditions established. The general political and economic condition in Russia brought about the Bolshevik revolution and the usurping of power by the Bolshevik party.

Chemical Industries under the New Order

Then a new period in Russian chemical industry began. At the beginning of the revolution, in October, 1917, all intellectual classes of the population declared a hard boycott to the Bolshevik rule. The State's officers refused to work under the Bolsheviks. The judges closed the courts. The engineer only remained at his task and stood guarding the industries. They could, and would, have saved the country from destruction; but, in spite of that fact, they became victims of their devotion. Many an engineer was killed, others dismissed or simply pushed out of the factories. Those who remained were obliged to work under the control of workers' committees and had no influence on the direction of the factory. No change, even of a purely technical character, could he make without an acknowledgment of the workers' committee. Engineers then began to run away from the factories. They remained without technical control. The Bolshevik Government did not take much heed of these events. They declared that Red technicians—that is, skilled workers—would lead the factories. They opened short-term courses in schools where the workers had to obtain the theoretical knowledge necessary to the direction of the factories. These courses are still in existence, and the Soviet Government still dreams of replacing the old engineers with new Red technicians and chemists. The graduates of these Red schools afterwards became administrators and managers of the factories; but the results of their management are appalling. The factories were quite destroyed. After two years only the Soviet Government understood that it is not possible to lead large industries without highly-educated specialists. Engineers and all specialists were then not only cordially invited, but mobilised. But, as the general conditions in factories, in regard to the relations between workers and engineers, had not yet been changed, many engineers avoided direct work in the factories, and endeavoured to find places in the administrative offices of the industry. Most of them worked as clerks. The wages that these engineers received were very small. They did not exceed the wages of a skilled worker, and in many cases were lower than those of the worker.

The Engineer Essential to any Government

Now the conditions are changed. A good specialist is paid much better wages than before. Nevertheless, the Russian engineer applied all his efforts in order to restore industry, but the general conditions were so terrible that he could do nothing. The engineer was not independent in his work, every step was controlled by the worker and the administrator of the nationalised industry. The destruction of transportation and the lack of materials reduced his work to an absurdity. In fact, almost all chemical factories were closed. Only those factories operated which had been considered by the High Council of the People's Economy as most important for the economy of the country. Actual operations under these conditions can be illustrated by the work of sugar refineries. In one year, 1920, all sugar refineries in Russia produced four million pounds of sugar (one pound equals 36·114 lb.), in 1921 three and a half million pounds, instead of one hundred and eleven million pounds in 1917. The average duration of the production period in 1920 balanced between five and twenty days, the majority of the factories having a production period one to twelve days, instead of three to four months, as in the year 1914.

The chemical analyses showed, as the writer remembers, the following figures:—

Sugar obtained from 1 berkovets (12 pounds) of sugar beets 40 lb. Instead of, in the year 1914.....82 lb.
Definite losses—2 per cent., instead of 0·5 per cent. in 1914.
Indefinite losses, 4·5 per cent., instead of 1·5 per cent. to 2 per cent. in 1914.
Consumption of fuel per 12 pounds of beets, 3 to 5 pounds of wood.

The cost of production of a pound of sugar, calculated in gold currency, reaches to 10 roubles, instead of the normal cost of 1·75 roubles, and this is under the conditions of very low wages paid in Russia, the average of which is equal to 20 per cent. of the wages paid previous to the war. The writer has personal knowledge of a very remarkable fact, which took place in the sugar industry, a fact which will seem an anecdote: The branch of sugar industry of the district of Kieff, which embraced 59 sugar factories, had produced in

1920 1,225,000 pounds of sugar, but had paid for the expenses of production in sugar alone 1,550,000 pounds, not to mention Soviet money, and other products, as salt, clothes, etc., as per arrangements with workers.

Russia on a Slow Up-Grade

With the beginning of the new economic policy the chemical industry of Russia has revived. Several chemical factories began to work. The new system of managing the factories, the system of trusts, which are specialised in regard to any lines of chemical industry, has ameliorated the general conditions of administration and work. The position of the engineer is much improved also since Lenin, in his speech to the all-Russian Conference of Soviets, declared that the most vital problem of Russia was the restoration of the economic forces of the country. Russia certainly needs more engineers and fewer politicians. Free trade and better conditions of work stimulated the productiveness of labour, but one cannot say that the chemical industry and also other industries are now successfully operating. The production of iron and steel reaches only 4 per cent. of the production before the war; the average production of other lines of chemical industry does not exceed 7 to 8 per cent. The results of sugar production of the past year are not yet known, but they are expected to amount to about twelve to fifteen million pounds—12 to 14 per cent. of the production previous to the war. In comparison with the year 1921, the average chemical production has been augmented twice to three times. The recent general situation of chemical industry in Russia can be illustrated with the following citation, taken from an article by Professor Bodganoff, single professor communist in Russia, printed in the *Ekonomicheskaya Ishien* (Economic Life), a paper of the Council of Work and Defence. Noting the growth of Russian industry as a consequence of the new economical policy, he says: "The growth of industry might be considered as normal if it were a consequence of the general economical restoration of the country, and if the industry, satisfying the demands of the country, could exhaust from the country the necessary means as payment for the services which the industry granted. But this normal connection of the industry with the general base of the national economy does not exist. Our free market, which has diminished buying ability, in consequence of the bad harvest, is not able to absorb the recent production of the industry, and, therefore, we are forced to diminish even the textile industry."

A strange and phenomenal situation! A country with a population of over 130 millions cannot absorb its small production in spite of the great need of everything. But this phenomenon can be easily explained with the financial condition of Russia at present, and the inability of any authority under any plan to reconstruct in a brief space the largest and quickest breakdown of established custom and order ever witnessed in any country.

A New Fast Dyeing Process

In connection with the new dyeing process referred to last week, Mr. Scholefield, the manager of Burgess, Ledward and Co., of Walkden, the company which has discovered the process, stated recently that this was not a case of a sensational discovery made in a few days, but was the result of exhaustive experiments, numbering some thousands, carried out over a period of several years. The discovery represented the result of a process of elimination which had produced an improved process for the application of dyes, which they guaranteed rendered the dyes absolutely fadeless. The number of dyes was not confined to one particular class. In the case of red, for example, Turkey red had hitherto been considered the most durable dye yet produced, but in the case of the red the firm had produced, which they called imperial red, they claimed to have produced a result which was far superior to Turkey red. The first intimation of the discovery, proceeded Mr. Scholefield, came at the recent Drapers' and Textile Exhibition in London, when at the end of a fortnight's boiling the colours applied by the firm's process had not faded. Since then more severe tests had been carried out in their own works, and each one had yielded a satisfactory result. The process, added Mr. Scholefield, could be applied not only to cotton cloth, but to mercerised cotton, and to some extent to artificial silk. Possibly, said Mr. Scholefield, in conclusion, the secret process might mean a slight increase in the cost of the goods so treated.

Oil and Colour Chemists

Hydrogenation Products of Benzene and Naphthalene

A PAPER on "Some hydrogenation products of benzene and naphthalene" was read before the Oil and Colour Chemists' Association, at Birkbeck College, London, on Thursday, April 12, by Mr. Noel Heaton, B.Sc. Dr. H. H. Morgan presided.

Mr. Heaton dealt with the process of hydrogenation for the conversion of liquid oils into solid fats, which was based on the possibility of combining hydrogen, by means of catalytic action, with an unsaturated organic compound. By this means unsaturated bodies, which were extremely susceptible to chemical reaction, could be converted to fully saturated bodies which were much more chemically stable, and which had quite different properties. The same principle as that used for conversion of the unsaturated aliphatic hydrocarbons could be applied to the aromatic hydrocarbons and their derivatives; thus benzene could be converted by hydrogenation to the saturated body cyclohexane. Any derivatives of benzene could be treated in the same manner by hydrogenation of the benzene nucleus, and this caused a complete change in the properties of the compound. The best known examples of such hydrogenation products were those derived from phenol and cresol, and the following table showed the change in physical properties:—

		Boiling Point	Sp. Gr.
Phenol	Crystalline solid	181° C.	1.084
Hexalin	Heavy liquid	160° C.	0.945
Cresol	Heavy liquid	190° C.	1.040
Methyl hexalin	Oily liquid	170–180° C.	0.930

The odour of the hydro-compound was in each case markedly different from that of the original compound. The phenolic characteristics, such as solubility in alkalis, and the pronounced acid and corrosive action which gave phenols such powerful antiseptic qualities, quite disappeared.

Industrial Uses

These hydrogenated phenols had many industrial uses on account of their powerful solvent and emulsifying properties, their chief use being in soap manufacture, as they formed a clear solution with aqueous soap solution and increased the detergent properties owing to their solvent action on oils and fats. A small quantity of hexalin soap added to mineral oils had a very powerful emulsifying action, enabling a permanent emulsion to be made with a large proportion of water. Emulsions of this type were used as spinning oils in the textile industries, because they could be removed readily by washing. In the cleaning of skins and fabrics the use of hexalin soap facilitates the work, as the hexalin dissolved any stains of an organic nature and enabled them to be readily removed by washing. Both hexalin (or cyclohexanol) and methyl-hexalin were now produced commercially for such purposes, and it was essential that they should be produced in a very pure state because the presence of any uncombined phenol or cresol would destroy one of the great advantages of these solvents—that they had no injurious action on fabrics. Hexalin could be polymerised to form highly viscous bodies resembling wax alcohols, such as wool grease alcohol; these were used in the production of super-fatted soaps. Hexalin was miscible with solvents such as carbon tetrachloride, tetrachlorethane, and similar compounds, but not with water or alcohols. The action in making soap with it was to facilitate saponification.

The complex aromatic hydrocarbons such as naphthalene can be hydrogenated in the same way as benzene, and this was of particular interest because it suggested a means of utilising what was practically a waste product. The amount of naphthalene produced in this country was about 40,000 tons per annum, and the demand was at present comparatively small. In the case of benzene the effect of hydrogenation was the reverse of that in the case of aliphatic hydrocarbons—instead of producing a solid fat from a liquid oil there was conversion of a solid to a liquid, or, where the original substance was liquid, a lowering of the boiling point. The same thing held with naphthalene,—i.e., by hydrogenation the solid naphthalene was converted into a mobile liquid.

Tetralin and Dekalin

Two distinct compounds were obtained on hydrogenation, according to whether one or both of the benzene rings was saturated, namely, $C_{10}H_{12}$ tetrahydronaphthalene or tetralin,

and $C_{10}H_{18}$ decahydronaphthalene or dekalin. There was, again, a complete change of the characteristic odour on hydrogenation, and the alteration of the physical properties was shown in the following table:—

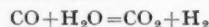
	Boiling Point	Flash Point	Sp. Gr.	Refractive Index
Naphthalene	218° C.	—	1.145	—
Tetralin	205° C.	172° F.	0.980	1.5402
Tetralin extra	190° C.	140° F.	0.900	1.4815
Dekalin	190° C.	135° F.	0.890	1.4675
Turpentine	156–180° C.	90–95° F.	0.852	—

The hydrogenation of naphthalene seemed only to take place in these two stages, either one or both of the benzene rings being saturated, no intermediate partially saturated rings being formed. But what was known as tetralin extra, an intermediate product between tetralin and dekalin, consisting of tetralin and dekalin in the proportion of 20 and 80 per cent., could be separated quite sharply into these two constituents. On fractionation it boiled steadily at 190° until all the dekalin was removed, and then there was a sharp rise to 207°, and further steady distillation at this temperature. Dekalin was a completely saturated body, and therefore, practically inert, but tetralin was partially unsaturated, and was, therefore, capable of reaction in many ways. It could be regarded as a benzol type of compound. Being partially unsaturated, it was liable to behave in a similar way to turpentine—i.e., it was capable of autoxidation and polymerisation. If exposed to the air for a long time, or evaporated over a water bath at a low temperature, it resinified. By evaporating 250 c.c. at a temperature of 80° C., Mr. Heaton obtained a residue of 7 c.c. of a brown resin.

The manufacture of tetralin and dekalin was started in Germany on a very large scale during the war for use as solvents to replace turpentine and petroleum spirits. Although the operation of hydrogenation was quite simple in theory, all that was necessary being the treatment of the substance with hydrogen in the presence of a catalyst, it was a matter of considerable skill to carry out the operation efficiently on a commercial scale. The raw material to be treated, the hydrogen, and the catalytic agent used to induce the reaction, must be in a high state of purity. The choice of catalyst was very important, the most effective being finely-divided nickel and copper oxide, and the degree of purity required in the case of all three ingredients for the process called for great skill in their preparation.

Preparing the Hydrogen

The usual method of preparing the hydrogen was by the purification of water gas. For this purpose the CO was removed from the water gas by treatment with superheated steam, when the reaction occurred.



The carbon dioxide was removed quantitatively by scrubbing with water under pressure, leaving the hydrogen perfectly pure. The plant for the production of hydrogen was extremely complicated and must be installed on a very large scale to work economically. As to purifying the raw materials, in the case of naphthalene the crude product was purified by melting and stirring with finely divided metals and fuller's earth, and then distilled and re-distilled until perfectly pure. The total installation for hydrogenation on an industrial scale was extensive and complicated, and required to be carried out on a comprehensive scale in order to be an economic success.

The reaction between the three materials was carried out in an autoclave fitted with very efficient stirring devices to ensure ample contact between the hydrogen and the reagents. Unlike the case of the hydrogenation of oils, where it was necessary to discharge the autoclave completely on completion of the reaction and to separate the catalyst from the finished product by filtration, the hydro-phenols could be distilled off from the autoclave, leaving the catalyst behind, and the autoclave could be charged and discharged some 50 times without opening it. The reaction proceeded automatically, and the end point could be detected readily by observing the increase of temperature and diminution of pressure which occurred. Tetralin was produced by treating pure naphthalene with hydrogen at a temperature of 150° C. An exact pressure in the autoclave was not essential, but the higher the pressure the more rapid the reaction. Dekalin was not made direct

from naphthalene, but by treatment of tetralin with fresh hydrogen at a higher temperature and pressure. 1,400 c. ft. of hydrogen was required to convert 1 ton of naphthalene to tetralin, and 35,000 c. ft. to convert it to dekalin.

Toxic Properties

As to the toxic properties of these substances, Mr. Heaton referred to the investigation of the subject by J. B. Coleman and P. Billham, at the instance of the Department of Scientific and Industrial Research. They investigated commercial tetralin extra, and, although their report, published last year, stated that the product was non-poisonous, it gave no data to support this. A report issued by the Ministry of Health in Berlin, in 1920, however, substantiated the statement, after experiments made on both animals and human beings. The experiments were drastic, and one was pretty safe in believing that under ordinary conditions of exposure no harmful results could develop. Mr. Heaton himself had experimented with it by working in a closed room in which he had established an atmosphere of different solvents of a concentration approximating to that which would obtain under the most extreme conditions of painting in a closed space. He found that he could work all day in an atmosphere of tetralin and dekalin vapour without discomfort or any after-effects, and although the smell was unpleasant at first, he got used to it and it soon ceased to worry him. A parallel experiment with turpentine gave the opposite result, the smell being more agreeable at first, becoming irritating later, and after two or three hours he developed headache and a feeling of nausea which persisted for some time after removal to the open air.

Uses as Solvents

Both tetralin and dekalin were powerful solvents of organic substances, the former having the greater solvent power of the two. Dekalin was practically equivalent to turpentine in solvent power,—i.e., it mixed in all properties with fatty oils and dissolved waxes and soft gums like damar, mastic and manilla in equivalent properties to turpentine, but did not dissolve hard gums such as kauri and copal, nor did it attack linoxyn. Tetralin, however, has a decided solvent action on linoxyn, and for that reason was too powerful for use as a paint thinner, as paint made with it would be liable to soften the undercoats: These substances did not act as alcohols did in their solvent action and did not dissolve shellac and similar substances which were soluble in methylated spirit. Dekalin was completely insoluble in ethyl alcohol, and tetralin is only partly soluble. But both were soluble in butyl and amyl alcohol, and an addition of 10 per cent. of butyl alcohol to a mixture of equal parts of tetralin and ethyl alcohol was sufficient to render them completely miscible. The statement that tetralin was a solvent for synthetic resins of the phenol-formaldehyde type was not correct. The albertol type of synthetic resins, in which the phenol-formaldehyde was combined with resin, were, however, soluble in tetralin, and the same applied to the synthetic resins prepared from coumarone.

Owing to the flashpoints of these naphthalene hydrides being very high, they were safer than turpentine, although not absolutely inflammable. The rate of evaporation of these solvents was considerably slower than that of turpentine, but evaporation was very complete, especially in the case of dekalin. The slow evaporation of tetralin, combined with its strong solvent action, rendered it very useful in the preparation of paint removers. The most powerful organic paint solvents hitherto available were tetrachlorethane and acetone, the former being objectionable on account of its toxic properties, and the latter on account of low flash point and great volatility. By using a mixture of tetralin and acetone a very powerful solvent was obtained, because the acetone attacked the film, which was then held in solution by the tetralin and kept soft for a sufficient time to enable it to be worked upon. The slow but complete evaporation, combined with the great solvent power, was also an advantage in the preparation of wax polishes, etc.

An Interesting Publication

The Explosives Engineer is the title of an excellently produced illustrated monthly magazine which has been started by the Hercules Power Co., U.S.A., for the users of explosives. Much interesting matter is included in the 28 pages of "number one." The leading article refers to Dr. C. E. Monroe, who is the chief explosives chemist of the United States Bureau of Mines.

March Trade Returns

THE publication of the trade returns for March has been delayed owing to a labour trouble, but the figures are now available. In view of the monthly variations in supply and demand for purposes of comparison we give the figures for the corresponding month last year in detailed tables, instead of the figures for the previous month. Taking chemical products as a whole, including dyes, drugs and colours, the imports for March, 1923, were valued at £1,252,756, an increase of £198,045 on March, 1922, and £105,247 on February, 1923. The exports for March, 1923, under the same head are valued at £1,912,077, an increase of £219,104 on March, 1922, and a decrease in value of £39,874 on February, 1923. Detail figures as to quantities are as follows:—

Imports for March

	1923.	1922.
INCREASES.		
Acid, acetic..... tons	611	218
Acid, tartaric (including tartrates) . . . cwt.	1,791	502
Bleaching materials..... cwt.	2,911	1,985
Borax..... cwt.	9,200	6,427
Calcium carbide..... cwt.	66,592	60,492
Red lead and orange lead..... cwt.	2,266	1,712
Nickel oxide..... cwt.	2,833	—
Sodium compounds (except nitrate) . . . cwt.	15,413	11,505
Sodium nitrate..... cwt.	231,902	62,178
Cream of tartar..... cwt.	4,634	4
Zinc oxide..... tons	490	455
Coal tar intermediates (including aniline oil, and salt, and phenyl glycin) . . . cwt.	414	—
Alizarine..... cwt.	3,718	107
Synthetic indigo..... cwt.	474	—
Barytes (including blanc fixe)..... cwt.	98,796	42,471
White lead..... cwt.	10,185	7,756
Mercury..... lbs.	15,009	13,429
DECREASES.		
Glycerin, crude..... cwt.	612	2,602
" distilled..... cwt.	373	682
Potassium compounds (except nitrate) cwt.	433,354	519,448
" nitrate..... cwt.	5,559	13,312
Dyestuffs, unspecified..... cwt.	2,750	3,363

Exports for March

	1923.	1922.
INCREASES.		
Acid, tartaric (including tartrates)..... cwt.	1,206	443
Ammonium chloride..... tons	379	287
" sulphate..... tons	18,343	12,868
Bleaching powder..... cwt.	33,229	16,078
Carbolic acid..... cwt.	9,095	8,655
Naphtha..... galls.	2,660	2,054
Naphthalene..... cwt.	15,249	1,003
Tar oil, creosote, etc..... galls.	2,655,226	2,608,226
Glycerin, crude..... cwt.	4,985	1,058
" distilled..... cwt.	7,481	815
Potassium nitrate..... cwt.	1,869	1,509
Sodium carbonate, etc..... cwt.	482,567	347,563
Caustic soda..... cwt.	121,019	110,598
Sodium chromate and bichromate . . . cwt.	3,846	1,989
" sulphate..... cwt.	53,074	45,724
Other sodium compounds..... cwt.	53,355	30,572
Coal tar dyes..... cwt.	7,522	3,529
Other synthetic dyes..... cwt.	4,627	3,693
Paints, etc., ground in oil or water . . . cwt.	33,398	17,486
Paints and enamels ready mixed . . . cwt.	22,108	14,593
Other paints unspecified..... cwt.	47,616	44,488
DECREASES.		
Acid, sulphuric..... cwt.	1,653	8,138
Unspecified coal tar products..... cwt.	25,482	27,286
Copper sulphate..... tons	6,076	6,664
Potassium chromate and bichromate . . cwt.	1,659	1,973
Unspecified potassium compounds. . . cwt.	999	1,127
Zinc oxide..... tons	146	249
Barytes (including blanc fixe)..... cwt.	1,484	8,172
White lead..... cwt.	16,485	18,397

It will be seen that in the main there has been an increase in the quantity of chemical products exported compared with 1922.

The Nitrogen Industry

THE British Association have issued in their series of reprints, a report on the discussion on the Nitrogen Industry, held at the Hull Meeting in 1922. The issue, which is priced at 9d., and numbered 14, contains in 10 pages a concise sketch, presented from all sides, of the present position in the synthetic nitrogen products industries of the world.

Professor Donnan in America

Address on "Membrane Equilibria"

AMONG the principal features of the symposium on colloids held by the Division of Physical and Inorganic Chemistry at New Haven, U.S.A., on April 6, was a paper by Professor F. G. Donnan, of London, on "Membrane Equilibria." In the experiments described by Professor Donnan, he used a copper ferrocyanide gel membrane supported by parchment. Solutions of various electrolytes were in turn placed on either side of the membrane, and after a definite lapse of time the solutions were analysed and the migration in either direction determined. Very close agreement was obtained with the theoretical equilibrium governing the concentration of the various ions in either solution. For example, in the case of sodium ferrocyanide on one side of the membrane and calcium ferrocyanide on the other, the cations alone diffusing through the membrane, the ratio of the two calcium concentrations, Ca_1/Ca_2 , agrees splendidly with the ratio of the square of the two sodium ion concentrations $(\text{Na}_1/\text{Na}_2)^2$:

Experiment	1	2	3	4	5
Ca_1/Ca_2	1.27	1.76	1.37	1.80	1.55
$(\text{Na}_1/\text{Na}_2)^2$	1.25	1.76	1.33	1.78	1.50

The sodium ratio is "squared," since for every one calcium ion that permeates through the membrane in one direction, two sodium ions must permeate in the opposite direction.

If only one ion moves through to one side and not the equivalent ion or ions the other way, then potential differences are set up, although these are very small. Professor Donnan's experimental results and the equations derived are all in full accord with our ideas and principles of adsorption and in general with thermo-dynamic principles.

Potash and Rare Metals from Oil Shales

MANY oil shales contain small quantities of potash, but in few cases even after complete retorting—that is, after removal of all volatile and fixed carbon—is the amount of water-soluble potash enough to make recovery feasible, according to Mr. M. J. Gavin, refinery engineer of the United States Bureau of Mines, Department of the Interior. It is not believed that oil shales can be worked commercially for their potash.

Much discussion has been aroused by reports that various investigators have obtained gold, silver and platinum from oil shales, usually by secret processes. Assays made by the United States Bureau of Mines on samples of oil shale said to carry one ounce and more of gold per ton, with corresponding silver and platinum, have indicated that although gold was present, it existed only as traces of the order of 0.01 ounce per ton, worth less than a shilling per ton. No silver or platinum has been detected. As many of those who claim to have found gold and other precious metals in paying quantities state that the metals cannot be detected or recovered unless they are "unlocked" by preliminary treatment, the Bureau made a series of tests and assays to determine the validity of these claims. Several of the tests were made in the presence of, and according to the methods said to be necessary by, one of the private investigators who has received much publicity from his reputed discovery of methods of recovering precious metals from oil shales.

A shale from which this investigator claimed he had recovered over seven dollars in gold per ton was used in the tests. Assays were made on the raw shale, spent shale, decarbonised shale, decarbonised shale treated with chlorine at temperatures most favourable for the formation of gold chloride, and on shale decomposed by chromic acid. All the assay returns checked closely, and indicated that the shale carried less than 65 cents in gold. The fire assay return on the raw shale was the same as on the shale subjected to the various preliminary treatments.

This work and similar assays by the Bureau of Mines, as well as other investigators, indicate little chance of gold and similar precious metals being commercially recoverable from oil shale. There is no particular reason why gold should occur in oil shale any more than it does in sea-water; and although it is possible that the small partings or fissures in the shales—not the shale itself—might carry notable quantities of these metals, it is not believed that oil shale will ever be a commercial source of gold, silver, platinum or allied metals.

Enamelled Apparatus for Chemical Plant

IN a paper recently given before the American Chemical Society by Messrs. E. P. Poste and Max Donauer, it is pointed out that the field of enamelled ware comprises many different varieties, ranging from bath tubs or cooking ware to acid-resisting stills. All these different enamels have been developed to meet the needs of particular industries. One cannot judge the serviceableness of one enamel under a given set of conditions from the success or failure of another. Enamelled equipment may be desired merely to protect from contact with metal, to resist organic acids, or to withstand severe inorganic acid conditions. Enamels have been developed to meet this entire range of conditions. A given enamel may act quite differently with regard to its resistance to different corrosive conditions. Different concentrations of a given acid vary so greatly with respect to action on enamel that a soft enamel may be possible at one concentration and entirely impossible at another.

In so far as the acid-resisting enamel meets all the chemical requirements of the others, this prompts the question why that enamel should not be on all equipment, and so have only one standard grade. There are limitations regarding the shape and size of a piece which can be enamelled, and the limitations are greater with the more acid-resisting enamels. The iron vessel must be of fairly simple design, with uniform surface to be enamelled. For acid conditions the enamel must not only be more resistant, but a perfect enamel coating is necessary. This limits the size of pieces to a smaller range and it is more essential to have a simple design. The limitations are gradually being extended or more thoroughly understood, and the entire range of enamelled apparatus covers interesting possibilities for many lines of industrial and chemical operations.

Salving a Cargo of Oil

IN the Mayor's and City of London Court, on Wednesday, April 25, before Judge Shewell Cooper, Arthur J. Humphery and Henry Grey, jun., Ltd., and the master and crew of the steam tug *Betty*, 55, Great Tower Street, E.C., claimed against Lever Bros., Ltd., the owners of the dumb barge or lighter *Norwood* (a large river dumb barge of about 80 tons burden, laden with a full cargo of oil in barrels), to recover £300 salvage services rendered to her. Mr. Hayward appeared for the plaintiffs, and Mr. A. Bucknill for the defendants. Plaintiffs' case was that the *Betty* went adrift in the river and that plaintiffs' steam tug picked her up and made her fast, thus preventing her from doing possibly very great damage, as she might have gone into steamers near by or to Tower Bridge. —The defence was that the defendants left the barge effectively tied up, and that she must have been cut adrift maliciously by some one or other. It was not suggested that the plaintiffs' men knew anything of that. The *Norwood* did not go adrift by the action of the tide. Plaintiffs' vessel was said to be worth £22,000. The value of the *Norwood* was £250, and her cargo £2,083. Mr. Bucknill urged that plaintiffs had rendered very minute service, and that salvage awards were to be based on public policy.—Mr. Hayward contended that plaintiffs had rendered good service and an ample award was called for to encourage good work. Judge Shewell Cooper found for the plaintiffs for £75 and costs.

Judgment in the Germoceca Case

JUDGMENT was delivered in the Chancery Division last week in the case in which the Taylors Drug Co., Ltd., of Burley Hill, Leeds, appealed against the refusal of the Registrar of Trade Marks to register the name Germoceca for ointment. The registration was opposed by the Veno Drug Co., Ltd., of Chester Road, Manchester, the owners of Germolene, and objected to by the Homoceca Co.

Mr. Justice Eve said that the names Germolene and Homoceca had been largely used for many years without confusion, and the question was whether the same immunity from confusion would be maintained with the introduction of the name Germoceca, a compound between the two. The Registrar had held that confusion would be caused, and he agreed with him. Therefore the appeal would be dismissed with costs.

Catalogues Received

HARRY L. B. CROUCH, LTD.—This firm specialise in safety equipment for men working in fumes, chemical dust, etc., and lists are issued giving particulars of special resistant gloves, masks, goggles and respirators of several patterns suitable for various purposes. The address of the firm is 70-71, Shoe Lane, London, E.C.4.

GWYNNE ENGINEERING CO., LTD.—We have received descriptive leaflets dealing with the Gwynne-Pennel "Invincible" Rotary Trap for using in connection with electrical pumps for lifting sewage or other liquids containing solids. The use of this combination in place of compressed air ejectors is claimed to have several advantages. The leaflet, which is fully illustrated, will be supplied on inquiry for No. L.616 from the makers at Hammersmith, London, W.6.

BRITISH DRUG HOUSES, LTD.—We have received from the chemical department of the above firm, at Graham Street, City Road, London, a copy of a list of 95 pages, giving the current prices of the chemical products of the firm. The list covers ordinary organic and inorganic chemicals such as acids, salts, common organic compounds, etc., analytic reagents, volumetric solutions, and specially pure chemicals for standardisation, test reagents and indicators, stains and requisites for microscopy, and, finally, aniline dyes. Copies will be forwarded to those interested on application to the above address.

JOSEPH BAKER, SONS AND PERKINS, LTD.—We have received two large, excellently produced catalogues from this firm, which is associated with A. Savy Jeanjean et Cie., of Paris. The first is number 198, section 1, and deals with modern chemical machinery, such as grinding, sifting, mixing, and drying machines for all purposes. The usefulness of the catalogue is greatly enhanced by the inclusion of tables showing the production obtainable with some of the machines when working with different substances. There are numerous illustrations and some 140 pages in all. The second catalogue (No. 199) is very similar in style, but deals with machinery for the manufacture of soaps and perfumery. The firm's London address is Kingsway House, Kingsway, W.C.2.

WALKER, CROSWELLER AND CO.—This firm forward from 265, Strand, London, W.C., a folder of their "Arkon" Draught and Pressure Gauges, Gas Volume Indicators and Recorders and Gas Analysis Recorders. The last mentioned are quite a wide range of recorders for the measurement of percentages of carbon dioxide, oxygen, sulphur dioxide and chlorine. These instruments are made up with a choice of charge ranges and also in combined types, e.g., CO_2 with O_2 and SO_2 with O_2 . These are useful in several different plants and works' processes. This firm is also specialising in Boiler House Control instruments, and reports that their "Arkon" Combined CO_2 and O_2 Recorder is steadily gaining ground as the ideal flue gas analysis instrument, superseding the single CO_2 recorder. Particulars will be supplied on application to Dane's Inn House, 265, Strand, London, W.C.2.

EDWARD G. HERBERT, LTD.—A descriptive leaflet has been issued by this firm from their Atlas Works, Levenshulme, Manchester, dealing with the Herfert Pendulum Hardness Tester. This consists of a pendulum four thousandths of an inch long (from the point of support to the centre of oscillation), the whole weighing nearly 9 lb. (4 kg.), which is balanced on a ruby or steel ball one millimetre in diameter. When placed on any substance and set swinging by a touch with a feather, it indicates the hardness of the surface on which it rests by the time of swing, which is read with a stop watch. Another test with the same instrument depends on a different principle and measures another kind of hardness. The pendulum is allowed to swing from a tilted position and the hardness is shown by the position, at the end of the swing, of a bubble in a curved tube against a graduated scale.

Westminster Bank, Ltd.

WESTMINSTER BANK, LTD., announce that they have acquired the business of the old-established firm of Messrs. Stilwell and Sons, bankers and navy agents, of No. 42, Pall Mall, London, S.W., and it has been arranged to transfer the business on an early date to Westminster Bank, Haymarket Branch, 26, Haymarket, S.W. Mr. W. C. Hodgson and Mr. G. H. Stilwell have been appointed joint managers, and Mr. W. B. Stilwell, assistant manager.

Chemical Matters in Parliament

Mr. Hardie (House of Commons, April 24) asked the President of the Board of Trade whether the question of buying coal by its thermal value had been considered by his Department in relation to gas manufacture. Sir P. Lloyd-Greame replied that though the basis upon which coal was purchased for the manufacture of gas was not a matter in which the Board of Trade had any jurisdiction, he was, of course, aware that the thermal value of the coal was one of the important factors in relation to its suitability for gas making.

Crude Gas Tar in Road Works

Lieut.-Colonel Campion (House of Commons, April 24) asked the Parliamentary Secretary to the Ministry of Transport why, in view of the satisfactory results obtained by the use of ordinary crude gas tar, the Roads Department insisted on local authorities using dehydrated or refined tar on roads under their jurisdiction at a higher cost to the rate-payers. In reply, Colonel Ashley stated that he was not prepared to admit that the use of ordinary crude gas tar for road works had been generally attended with satisfactory results. Many instances to the contrary could be quoted, especially in areas where roads drained into fishing streams. In order to secure a tar of known constituents and ascertained qualities, a specification had been drawn up by his Department, after consultation with representatives of the interests concerned, and, while local authorities were not debarred from using crude tar, the observance of the Roads Department specification was a condition attaching to all grants made from the Road Fund.

Annual Meeting of the Royal Institution

THE annual meeting of the members of the Royal Institution was held on Tuesday afternoon, Sir James Crichton Browne, Treasurer and Vice-President, in the chair. The annual report of the Committee of Visitors for the year 1922, testifying to the continued prosperity of the Institution, was read and adopted. The report of the Davy-Faraday Research Laboratory Committee was read. Sixty new members were elected in 1922, and 63 lectures and 19 evening discourses were delivered. A total of 588 volumes was added to the library in the year. Thanks were voted to the president, treasurer and secretary, to the committees of managers and visitors, and to the professors for their services to the Institution during the past year. The following were unanimously elected as officers for the ensuing year:—President, the Duke of Northumberland; Treasurer, Sir James Crichton-Browne; Secretary, Sir Arthur Keith; Managers, Sidney G. Brown, John Mitchell Bruce, Sir Dugald Clerk, John Ambrose Fleming, Sir Richard Glazebrook, Earl Iveagh, Sir Alexander C. Mackenzie, Robert Mond, Sir Edward Pollock, Alfred W. Porter, Lord Rothschild, Sir David Salomons, William Stone, Sir Alfred Yarrow, the Right Hon. Lord Justice Younger. Visitors, Sir Harry Baldwin, William A. Bone, Alfred Carmichael, Ernest Clarke, Edward Dent, Thomas W. Dewar, George H. Griffin, W. E. Lawson Johnston, Colonel F. K. McLean, Sir Malcolm Morris, W. Rushton Parker, Walter Peacock, Major C. E. S. Phillips, Hugh Munro Ross, and Sidney Skinner.

Properties and Uses of Tantalum

PURE tantalum, which can be produced from tantalite and manufactured into sheet, rod or wire, is quite soft, having a melting point next to that of tungsten, and is characterised by great ductility. Chemically, tantalum is exceedingly inert to the action of all chemical reagents. The only acid which will attack it to any extent is hydrofluoric acid. Present or possible uses include parts of wireless valves, dental instruments, filaments for incandescent lamps, analytical weights, etc. One of its most interesting properties arises from the fact that it can act as an electrolytic valve, so that with a suitable set-up alternating current may be converted into a direct pulsating current, which can be used for charging storage batteries. Its property in this respect is similar to that of aluminium, but in the case of tantalum there is no problem due to the corrosion of the metal. The use of this metal for chemical equipment in the larger sizes will ultimately depend upon the cost at which it can be produced.

From Week to Week

H. C. SLINGSBY, of 142, Old Street, London, truck manufacturer, has now changed his address to Regent House, Kingsway.

DR. BERNARD DYER has been elected chairman of the London Section of the Society of Chemical Industry for the year 1923-24.

PROFESSOR GRANVILLE POOLE, a member of the staff of the Mining Department of Leeds University, is to succeed Professor Henry Louis at Armstrong College, Newcastle.

THE RIDGE ROASTING FURNACE AND ENGINEERING CO., 2, Great Winchester Street, E.C.2, announce that their new telegraphic address is "Ridgenzie Stock, London," instead of "Ridgenzie Ave, London."

AT CAMBRIDGE on Friday, April 27, at a University Congregation, approval was given to an address drawn up by the Public Orator to the Universities of Paris and Strasburg on the ceremonies connected with the centenary of the birth of Pasteur in May.

LADY MUSPRATT spoke at the concluding luncheon of the United Alkali centenary celebrations on Saturday, April 21, at the Midland Adelphi Hotel, Liverpool, and pointed out that though chemists had produced the "elixir of death," they had saved this country in the war.

At the April meeting of the Franklin Institute, the Howard N. Potts Gold Medal was presented to Dr. ALBERT W. HULL, of the Research Laboratory, General Electric Company, Schenectady, New York, for his paper on "The Crystal Structure of the Common Elements."

THE IMPORTS of chemicals and drugs into Australia for the six months, July, 1922, to January, 1923, according to the official report of His Majesty's Senior Trade Commissioner (Mr. S. W. B. McGregor), are valued at £2,331,430, compared with £1,925,559 for the corresponding six months of 1921-22.

ALL THE MEN employed at the National Oil Refineries' new works at Skewen, near Neath, numbering 1,600, struck work on Saturday, April 28, in sympathy with the fitters, who have been on strike for over three weeks against a reduction in wages. Repeated efforts to effect a settlement have failed.

IT IS ANNOUNCED from Washington that American chemists working in the Army laboratories have discovered an effective treatment for tuberculosis and influenza, which takes the form of inhalation of gases similar to those used in warfare after a process of dilution. A report giving full details of the discovery has been forwarded to the Army Department.

THE PROPOSED WAGES REDUCTION in the chemical trade of the kingdom has been submitted to the executives of the unions concerned. The National Joint Industrial Council has agreed on a decrease of a farthing per hour from the first pay in May, and a further farthing in July, with stabilisation until September 30. This proposition is now being voted upon.

MR. ARTHUR MARKS, F.I.C. A.M.I.Mech.E., etc., has been appointed metallurgical adviser to A. Harper, Sons and Bean, Ltd., Dudley. Mr. Arthur Marks, who has been for the past seven years metallurgist and head of the testing department of Harland and Wolff, Belfast, has had large practical foundry experience with Diesel and reciprocating engine castings and forgings.

AT THE ROYAL INSTITUTION the Friday evening discourse on May 11 will be given by Professor W. A. Bone on "Gaseous Combustion at High Pressures," and on May 18 by Mr. W. M. Mordey on "Studies in Alternating Magnetism." Sir Ernest Rutherford's postponed discourse will be given on Friday evening, June 15, and his concluding lecture on "Atomic Projectiles" on Saturday afternoon, June 16.

IN A LECTURE at the Royal Society, London, on Thursday, April 26, Professor W. A. Bone referred to the effect of the addition of nitrogen to mixtures of carbon monoxide and oxygen when exploded at very high pressure (up to 1,000 atmospheres) in the presence of a little hydrogen. The rate of explosion was found to be considerably diminished, energy apparently being absorbed at first and being used to produce nitric oxide which appeared finally. This, of course, is the basis of the Häusser process for nitric acid.

AT A MEETING of the Liverpool section of the Society of Chemical Industry on Friday, April 27, officers were appointed as follows: Chairman, Mr. Edwin Thompson; vice-chairman, Dr. G. C. Clayton, M.P.; secretary, Mr. E. Gabriel Jones; treasurer, Dr. Alfred Holt. Dr. H. A. Auden, Colonel E. Briggs, Captain F. W. Bain, and Dr. C. H. Clarke were unopposedly appointed to the committee. At the same meeting papers on "Petroleum" (by Mr. W. Ramsey) and the "Estimation of Sulphur" (by Mr. J. M. Taylor) were read.

THE HOME SECRETARY announces that as a result of inquiries made in connection with the investigations into the illicit traffic in dangerous drugs which led to the recent conviction of H. M. F. Humphrey, he has decided to cancel the licences held under the Dangerous Drugs Act, 1920, by the firm of Messrs. Whiffen and Sons, Ltd., of Lombard Road, Battersea (also trading under the name of J. A. Wink and Co.), and they will not for the future be allowed to buy, manufacture, sell, or have any dealing in the drugs to which that Act applies.

AT THE APRIL EXAMINATIONS of the Institute of Chemistry Mr. A. T. Grisenthwaite, A.C.G.F.C., B.Sc. (Lond.), passed the examination for the Fellowship in chemical engineering, and the following passed the examination for the Associateship in general chemistry: Messrs. P. J. Brady, East London College; H. J. Grayson, University College, London; L. W. Gregory, University College, Nottingham; G. Loasby, B.Sc. (B'ham), Birmingham University; L. W. Marrison, East London College; H. W. V. Player, King's College, London; D. A. Smith, University College, Nottingham; G. J. C. Vineall, B.Sc. (Lond.), University College, Southampton.

BUSH, BEACH AND GENT., LTD., dealers in chemicals and dyes, of 10, Union Court, Old Broad Street, London E.C.2, announce in a circular that the company is now entirely British owned, and that Bush, Beach and Gent., Inc., of New York, no longer hold any interest in it. The company has relinquished the sole agency hitherto held for Bush, Beach and Gent., Inc., of New York, but offer to facilitate business between customers and the American company, where this is desired. The company will continue to handle American chemicals as well as British and Continental products. It is removing shortly to larger premises at 24, Monument Street, E.C.3.

A SUGGESTION contained in the report of the Liverpool section of the Society of Chemical Industry that a hospitality fund should be instituted from voluntary contributions, was commended by Professor E. C. C. Baly, who presided at the annual meeting of the section, held on Friday, April 27, in the Muspratt chemical lecture theatre of the University. Professor Baly said the idea would allow them to entertain lecturers to the section, and enable them to defray the expenses of those lecturers coming from a long distance. He had pleasant recollections of the hospitality of the Manchester section, which had such a fund. The suggestion is to be considered by the committee.

THE DEATH OCCURRED in Birmingham last week of Sir John Bart (formerly head of the brewing firm of Holders', Ltd., which was recently absorbed in Mitchell and Butlers, Ltd.), one of the most public-spirited citizens of Birmingham. Sir John was a liberal supporter of the University of Birmingham. He enlisted the assistance of a number of brewers in the Midlands in raising the first large fund, called the Brewers' Fund. The amount subscribed was nearly £30,000, of which £20,000 was applied to the general account of the University and the balance to the establishment in connection with it of the British School of Malting and Brewing and Biological Chemistry (of which Professor Ling is now the head).

THE NOTTINGHAMSHIRE COUNTY COUNCIL Food and Drugs Committee last week reported that the Ministry of Health had intimated that they were not prepared to approve of the temporary appointment of the assistant to the late county analyst as county analyst, on the ground that he did not hold the necessary qualifications. The committee recommended the Council to appoint Mr. John Evans, of Sheffield, as public analyst for the county at a retaining fee of £50 to cover the first fifty samples; a fee of £1 per sample for the second fifty; and a fee of 10s. per sample in excess of 100 per annum. Mr. Evans holds similar appointments for Sheffield and York, the county of Cardigan, and the county boroughs of Rotherham and Barnsley, and the borough of Doncaster.

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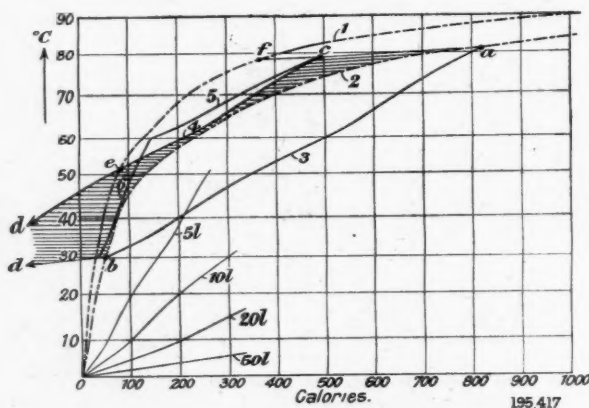
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Abstracts of Complete Specifications

- 195,417. MOND GAS PROCESS, RECOVERY OF THE SENSIBLE HEAT OF GASES IN. H. R. Trenkler, 13, Humboldtstrasse, Berlin-Steglitz, Germany. Application date, October 29, 1921.

In the usual Mond gas process, part of the steam necessary is provided by the heating and saturation of cold air by means of hot water which has been heated in the process of cooling the gas. The sensible heat of the producer gas may be used to heat the mixture of air and steam in a counter-current heater. The sensible heat of this gas and the contained moisture amounts to 25-30 per cent. of the heat contained in the fuel, but only about 6-7 per cent. can be made use of in heating the air and steam, and a further 6-7 per cent. from the hot cooling water in the towers in which the air is heated and saturated. When brown coal and peat are gasified, a smaller proportion of the sensible heat of the gases is available owing to its low temperature. The object of the present invention is to recover a larger proportion of the sensible heat of the producer gas. In the diagram, the line 1 represents the heat contained in 1 cubic metre of air saturated with steam at different temperatures. One cubic metre of air

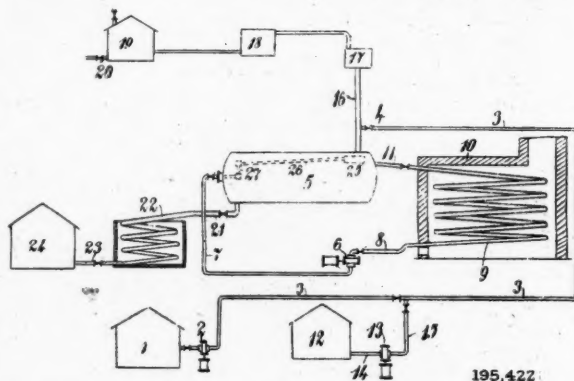


corresponds to 1.7 to 1.9 cubic metres of gas produced, and the heat of the latter is indicated by the line 2. The heat contained in a definite volume of water at different temperatures is represented by various radial straight lines. If it is desired to cool 1.8 cubic metres of gas from 82° C. to 30° C., the points *a b* are joined, giving the line 3 which is parallel with the line for about 16 litres of water, so that about 9 litres of water are necessary for each cubic metre of gas. In practice, considerably larger volumes of water are used, but since the heat lost by the gas and the heat gained by the water must be equal, the end points of the heat contained in the water must lie between parallels through *a* and *b*. Thus *ac* and *bd* are parallel, and *ced* and *ab* are parallel. The position of the line 4 is determined by the fact that the heat contained in the water at any stage must be less than the heat contained in the gas, so that the line 4 must lie wholly to the left of the line 2. When air is being saturated by hot water the reverse conditions hold, *i.e.*, the line 4 must lie wholly to the right of the line 1. At the point of intersection of these two lines, *e*, no further utilisation of the heat in the water is possible. Such a condition may be obtained when the water serves both for cooling water and for saturation water. In this invention the difficulty is avoided by substituting several intersecting lines 5, 6 for the line 4, *i.e.*, the cooling as well as the saturation takes place in several stages, the quantity of water for each stage being adjusted so that the lines for the heat contained in the cooling water always lie between the lines 1 and 2. In the apparatus employed, the hot cooling water from one gas cooler passes through an air saturation tower, but the hot cooling water from the second gas cooler usually employed is not conducted directly to the chimney cooler, but to a second air saturation tower and thence to the chimney cooler. The

air for gasification passes through the saturation towers in the reverse order. In a modified arrangement of the apparatus a higher air saturation temperature may be obtained by heating the unsaturated air by means of the sensible heat of the producer gas before it passes into the air saturation tower. Further, the water coming from the cooling process may be preheated by the heat of the producer gas before entering the saturator.

- 195,422. LOW BOILING POINT OIL FROM A RELATIVELY HIGHER BOILING POINT OIL OR FRACTION, METHOD OF PRODUCING. R. W. Hanna, 474, Carlson Avenue, Richmond, Cal., U.S.A. Application date, November 21, 1921.

The process is for cracking hydrocarbon oils without deposition of carbon or tarry residues in the heating element. The oil to be cracked is circulated through the apparatus, together with a solvent oil of lower boiling point which remains substantially uncracked and unvaporised at the temperature and pressure in the system. The heavy residues remain in solution in the solvent oil. The solvent oil may be a distillate from refractory California crude oil which contains a relatively high percentage of naphthene and aromatic hydrocarbons. The solvent oil is drawn from a tank 1 by a pump 2, and forced by pipe 3 to the evaporator 5. A circulating pump 6 is then started to circulate the oil through the pipe, 27, 7, 9. The pipe coil 9 is then heated, and the oil to be cracked is fed from a tank 12 by a pump 13 into the pipe 3. The cracked vapour passes through the pipe 16, in which it is scrubbed by the incoming oil and the higher boiling fractions condensed. The cracked vapour passes into a dephlegmator 17, where any of the solvent oil remaining is condensed and returned to the evaporator 5. The low boiling fractions pass to a condenser 18 and receiver 19. The residues are maintained in solution



in the evaporator 5, and are drawn off through the valve 21 to a cooler 22 and tank 24. The amount of heavy hydrocarbons is maintained at such a point that during the circulation of the oil the solvent oil is still capable of absorbing further high-boiling fractions. In some cases petroleum distillates when cracked produce sufficient solvent oil of unsaturated form to keep the tarry residues in solution, in which case it is unnecessary to add further solvent oil. The proportion of solvent oil used may be 3 to 5 times that of the oil to be cracked, and a temperature of 745°-800° F. and pressure of 105-120 lb. per square inch absolute may be used. The oil supplied to the evaporator through the pipe 4 is preferably received in a pan 25, from which it passes through a pipe 26 into one end of a T-pipe 27, a second opening of which opens into the evaporator 5, and the third opening into the pipe 7.

- 195,463. PIGMENTS OR PAINTS, MANUFACTURE OF. T. Hughes, Danes Inn House, 265, Strand, London, W.C.2. Application date, January 3, 1922.

The object is to obtain coloured pigments by fixing an acid soluble colour on anhydrous magnesium carbonate as the base. In one example for producing a blue pigment, the

amount of iron contained in a sample of magnesite is determined by analysis, and the magnesite is then treated with a 20 per cent. solution of sulphuric or other acid at about 60° F., containing the equivalent of potassium ferrocyanide. Some of the magnesite is dissolved, together with the contained iron, which reacts with the ferrocyanide forming prussian blue. The undissolved anhydrous magnesium carbonate is separated continuously until the acid is neutralised, and carries with it the prussian blue. This magnesium carbonate is highly acid-resistant, and nearly insoluble in cold acids. The washed and dried blue pigment is capable of absorbing a large proportion of linseed oil. Instead of potassium ferrocyanide, colours which are soluble in the acid solution may be used, *e.g.*, saffranine (a diamido derivative of phenyl or naphthyl phenazine) or malachite green (triphenyl-methane dyestuff).

- 195,467. SEPARATING THE LIQUID AND SOLID COMPONENTS OF MIXTURES OF LIQUIDS AND CRUSHED OR GROUND ORE PRODUCTS, APPARATUS FOR. A. J. Arbuckle, 10a, Johannes Street, Troyeville, Johannesburg, South Africa. Application date, January 9, 1922.

The mixture of ore and solvent liquid is allowed to settle in an inverted conical tank provided with a special form of discharge device for the settled solids at the bottom. The bottom of the tank communicates with a horizontal conduit containing a coaxial reciprocating shaft carrying perforated discs or plates spaced apart along the length of the shaft. These discs are arranged in groups of gradually increasing diameter towards the discharge end, which communicates with a vertical elevating conduit. The latter conduit contains a reciprocating shaft carrying similar perforated discs of uniform diameter with valves arranged at intervals. The elevating and conveying shafts are interconnected in such a way that during the outward stroke of the conveying device, the elevating device moves through its inward stroke. The apparatus is described in detail.

- 195,497. SOFTENING WOOD. J. Y. Johnson, London. From Badische Anilin & Soda Fabrik, Ludwigshafen-on-Rhine, Germany. Application date, February 14, 1922.

Wood of any kind may be softened by saturating it with aqueous soap solutions of practically any soap, *e.g.*, lard or other fat soaps, wax soap, and soapy compounds such as sulphonates of fatty acids. The solution may be either cold or warm, and the saturation is effected at comparatively high pressures, up to 1,500 lb. per square inch. A suitable apparatus for the purpose is the "Dorfer" apparatus used for saturating wood with dyestuffs. Examples of suitable impregnating solutions are: (1) soap 10 parts, water 1,000 parts; (2) turkey-red oil F 20-40 grams, water 1 litre; (3) stearic acid 7.5 grams, Japan wax 22.5 grams, sodium carbonate 6 grams, water 5 litres. Any dyestuffs may be added, and the process is suitable for treating woods such as fir, spruce, alder, etc., to produce a substitute for Florida cedar wood for the manufacture of pencils, etc.

- 195,513. INTERMEDIATE PRODUCTS FOR DYESTUFFS, MANUFACTURE OF. O. Y. Imray, London. From Soc. of Chemical Industry in Basle, Switzerland. Application date, March 18, 1922. Addition to 172,177.

Specification No. 172,177 (see THE CHEMICAL AGE, Vol. VI., p. 15) describes the reaction between a tetra-halogen derivative of methane and 1-oxynaphthalene-2-carboxylic acid, in the presence of a substance capable of neutralising an acid, to produce dyestuffs derived from trioxo-trinaphthyl-methane. It is now found that two intermediates are formed during this reaction—viz., 4 : 4'-dioxydinaphthyl-1 : 1'-ketone-3 : 3'-dicarboxylic acid, and 1-oxynaphthalene-2 : 4-dicarboxylic acid. The alkali and alkaline earth salts of these substances have different solubilities, and this enables them to be isolated by the process described in 172,177. It is found that the yield of these intermediates may be increased, and that of the dyestuff decreased, by suitably varying the proportions of the reacting substances and the strength of the solutions. In an example, the mother liquor remaining after separating the dyestuff is acidified with hydrochloric acid, and the precipitate filtered and dissolved in sodium carbonate solution. Sodium chloride is then added and the disodium salt of 4 : 4'-dioxydinaphthyl-1 : 1'-ketone-3 : 3'-dicarboxylic acid is precipitated.

This substance is slightly soluble in water and organic solvents, but readily soluble in alkali carbonates and caustic alkalis. The liquor from which this product was precipitated is acidified, and the precipitate filtered and dissolved in a boiling solution of baryta. The solution is acidified and the other intermediate, viz., 1-oxynaphthalene-2 : 4-dicarboxylic acid is precipitated. Other examples based on the process described in Specification No. 172,177 are given.

- 195,556. GOLD AND SILVER BEARING ANTIMONY ORES, PROCESS FOR THE TREATMENT OF. Z. Metzl, 4, Rue d'Agnesseau, Paris. Application date, June 16, 1922.

Auriferous antimony ores cannot be treated for the recovery of gold by the amalgamation, cyanide or chlorine processes without considerable loss of gold. In the present invention the ore is treated with a very dilute solution of sodium carbonate or other alkali carbonate in the presence of quicklime. Heat is generated, and the nascent sodium hydroxide produced quickly dissolves the antimony sulphide to a sulph-antimoniate. The temperature should be kept at 70°-100° C. and the mixture agitated. The solution containing the antimony is filtered off, and the residues treated by the ordinary processes for the recovery of gold and silver. Antimony may be recovered from the solution by electrolysis, or the solution may be treated with gases containing carbon dioxide, such as furnace gases, to precipitate antimony sulphide, which is then treated in the usual way. Alkali carbonate is produced in the solution, which may thus be used for further treatment of the ore.

- 195,559. PLASTIC COMPOSITIONS. The British Thomson-Houston Co., Ltd., Crown House, Aldwych, London, W.C.2. From the General Electric Co., Schenectady, N.Y., U.S.A. Application date, June 20, 1922.

The object is to ensure that compositions such as phenol-formaldehyde resins (Bakelite) are heated to the temperature necessary to harden them, and to provide a permanent indication that they have been so heated. The plastic mixture is mixed with a small quantity of a colouring material of such a character that its appearance is permanently changed when the desired temperature has been reached. The most suitable colouring materials are found to be dyes of the triphenyl methane group and diphenyl methane group. In the case of a cement which should be heated to 150°-260° C. to render it soluble and infusible, a small quantity of malachite green dye may be added. This imparts a bright green colour to the cement, which fades out permanently at about 180° C., the temperature necessary to obtain the best results. In the case of a cement which it is required to heat to a higher temperature, methyl violet, which fades out at about 220° C., may be used. Auramine yellow may also be used instead of methyl violet. In an example, 50 lb. of the phenol-formaldehyde resin is mixed with 2.5-4 lb. of denatured alcohol containing 8.5 grams of malachite green. With these indicators, it is possible to get the best results with unskilled labour and the product affords a permanent indication that it has been heated to the necessary temperature. The indicators may also be used with other types of plastic compositions.

- 195,569. VISCOSE, PROCESS FOR MANUFACTURING AND PRODUCTION OF ARTIFICIAL SILK AND LIKE PRODUCTS NOT LIABLE TO LOSE THEIR RESISTANCE BY CONTACT WITH WATER. H. Delahaye, La Taupinière, Destelbergen, near Ghent, Belgium. Application date, August 31, 1922.

The object is to obtain viscose which may be used for the manufacture of artificial silk without the necessity of "ripening." It is known that when cotton is subjected to mercerising by treating with caustic soda of 30°-40° Bé. at ordinary temperature, or of 20°-25° Bé. strength at about 0° C., the strength is considerably increased, and this fact is made use of in the present process. The treated material is then pressed to remove the excess of caustic soda and then reduced to pulp, while still at a temperature about 0° C. The temperature is then allowed to rise to 15° C. for one or more days, to allow a slight hydration, and the material is then treated with 10-15 per cent. of carbon bisulphide to produce a xanthogenate of hydrated cellulose. This product is not soluble in caustic soda, and may be used immediately for

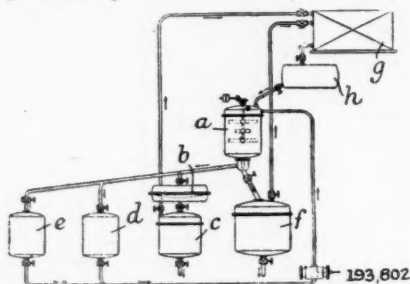
spinning or drawing. If the viscose is kept below 10°C . for one to three weeks, an almost complete dehydration takes place and the product may be used for the manufacture of an artificial silk which is practically unaffected by water.

NOTE.—Abstracts of the following specifications, which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention:—183,117 (J. T. Ellsworth) relating to an electrolytic process of recovering zinc from complex ores, see Vol. VII., p. 392.

International Specifications not yet Accepted

193,802. EXTRACTING AND PURIFYING HYDROCARBONS. Allgemeine Ges für Chemische Industrie, 35, Unter den Linden, Berlin. International Convention date, February 21, 1922.

Hydrocarbons are purified by treating them in stages with progressively purer sulphur dioxide. In an example, lignite tar or oil is mixed with several volumes of twice-used sulphur dioxide, and cooled to -10°C . in an extractor *a*. The extract containing sulphur dioxide forming the lower layer is drawn off through a filter press *b* to a still *c*, and the precipitated



paraffin wax rises to the surface. A further extraction is then made with once-used sulphur dioxide from a tank *e*, and the extract is run into the tank *d* for use in treating a fresh quantity of tar. A further extraction is then made with pure sulphur dioxide from a tank *h* and condenser *g*, using a temperature of 40°C . and the liquid paraffin is run off to a still *f*. Anthracene and montan wax are washed out into the still *f* with pure sulphur dioxide. The process is applicable for purifying lubricating oil, and also for the purification of crude anthracene and crude montan wax.

193,834. DYES. Farbwerke vorm. Meister, Lucius, und Brüning, Hoechst-on-Main, Germany. International Convention date, February 24, 1922.

Diazo compounds are coupled with *o*-alkyloxy, *o*-aryloxy-, or *o*-aralkyloxy-anilides of 2:3-oxynaphthoic acid to obtain monazo dyes. A red pigment dyestuff may be obtained from diazotised 4-chlor-2-toluidine and 2:3-oxynaphthoic-*o*-aniside, and other examples of diazo-components and second components are also given.

193,843. CHLORINE DERIVATIVES. Durand et Huguenin Soc. Anon., Basle, Switzerland. International Convention date, February 23, 1922.

The process is for obtaining highly chlorinated hydroaromatic products containing nitrogen by chlorinating hydrochlorides of aromatic amines with chlorine in an indifferent liquid, moisture being excluded. Examples are given of the chlorination of aniline hydrochloride in cold or hot chlorobenzene to obtain an octochlor-chlor-ketimido-hexahydrobenzene, and in benzene to obtain a hexachlor-chlorketimido-hexahydrobenzene. Other examples are given of products obtained from α - and β -naphthylamines, α - and β -aminoanthraquinones. The suspensions of the amine hydrochlorides are obtained by treating a solution of the amine in benzene or chlorobenzene with gaseous hydrochloric acid.

193,866. DYES. Farbwerke vorm. Meister, Lucius, und Brüning, Hoechst-on-Main, Germany. International Convention date, February 24, 1922.

Diazo compounds are coupled with *p*-toluidide, a *p*-alkyloxy-anilide, a *p*-aryloxyanilide, or a *p*-aralkyloxyanilide of 2:3-oxynaphthoic acid in which the aryldio group contains halogen as a substituent, to obtain azo dyes. Several examples of printing, padding and dyeing solutions are given.

LATEST NOTIFICATIONS.

- 196,258. Process for the manufacture and production of chemically pure hydrochloric acid. Verein Für Chemische und Metallurgische Produktion. April 13, 1922.
- 196,265. Manufacture of artificial resins. Holzverkohlungs-Industrie Akt.-Ges. April 11, 1922.
- 196,269. Manufacture of nitrogen peroxide. Soc. l'Air Liquide, Soc. Anon. pour l'Etude et l'Exploitation des Procédés G. Claude. April 15, 1922.
- 196,272. Process for converting hydrocarbons or their halogen substitution products into others containing a higher number of carbon atoms. Farbwerke vorm. Meister, Lucius, und Brüning. April 15, 1922.
- 196,579. Process of manufacturing glycerine and alkali soaps. Schmidt, L. April 21, 1922.
- 196,585. Process for treating ammonium chloride lyes in iron vessels. Henkel et Cie, and Weber, Dr. W. April 22, 1922.
- 196,593. Explosives and a process for their manufacture. Etablissements Davey, Bickford, Smith, et Cie Soc. Anon. Française. April 19, 1922.
- 196,601. Process for the preparation of urea salts from cyanamide. Elektrizitätswerk Lonza. April 20, 1922.
- 196,623. Treatment of vegetable and animal oils. Chemische Fabrik Aspe. April 22, 1922.

Specifications Accepted, with Date of Application

- 174,089. Heavy hydrocarbon oils into lighter hydrocarbon oils, Process for converting. Standard Oil Co. January 15th, 1921.
- 181,352. Liquefied gases, Cooling apparatus or receptacles for. L'Air Liquide, Soc. Anon pour l'Etude et l'Exploitation des Procédés G. Claude. June 8, 1922.
- 193,034. Separation of solid materials by centrifugal means, Apparatus for. F. Radelet. February 8th, 1922.
- 195,995-6. Paints, Manufacture of. D. Gardner. October 11th, 1921.
- 195,998. Pure alumina, Production of. M. Buchner. October 12, 1921.
- 196,002. Decolorisation and clarification of fats, oils, sugars, and other liquids, and adsorptive materials for use therein. A. C. Cumming and Klarit, Ltd. October 14, 1921.
- 196,012. Insecticidal and fungicidal preparations, Process for the manufacture of. J. A. Vielle. November 14, 1921.
- 196,023. Methanation of water gas and the manufacture of methane from such gas. T. P. Hilditch, and J. Crosfield and Sons, Ltd. December 14, 1921.
- 196,073. Detergent agents, Method of manufacturing—and the detergent agents produced thereby. A. L. Mond. (Kendall Products Corporation). January 13, 1922.
- 196,115. Sulphate of ammonia, Process and apparatus for drying and neutralising. G. A. Phillipson. January 26, 1922.
- 196,203. Crushing and grinding mills. F. Wriedt, and Milo Machinery Co. Proprietary, Ltd. May 29, 1922.

Applications for Patents

- Badische Anilin- und Soda-Fabrik and Johnson, J. Y. Production of tanning materials. 10583. April 18.
- Production of vat colouring matters. 10584. April 18.
- Carmichael, W., and Chemische Fabrik auf Aktien vorm. E. Schering. Manufacture of vaccines from bacteria. 10804. April 20.
- Coke and Gas Ovens, Ltd., C. Still, A. Kuhn, and P. Fritzsche. Apparatus for extraction and removal of resin from solution in acid. 10592. April 18.
- Waste acid regenerating plant. 10593. April 18.
- Compagnie de Béthune Soc. Anon. Manufacture of ethyl alcohol from sulphovinic acid. 10469. April 17. (France, May 4, 1922.)
- Dreyfus, H. Dyeing cellulose ethers. 10749. April 20.
- Imray, O. Y., and Aquazone Corporation. Apparatus for dissolving gases. 10461. April 17.
- and Soc. of Chemical Industry in Basle. Manufacture of dye-stuffs, etc. 10894. April 21.
- Long, S. H. Preparations of colloidal solutions. 10236. April 16.
- Abbott, R. H. S., and Davidson, T. M. Distillation of coal, etc. 11212. April 25.
- Agricultural Developments Co. (Pyriford), Ltd., and Hutchinson, H. B. Manufacture of nitrogenous fertilizers. 11003. April 23.
- Bloxam, A. G., and Chemische Fabrik Griesheim-Elektron. Manufacture of azo dyestuffs. 11223. April 25.
- Broadbent and Sons, Ltd., T. Hallitt, W., and Sturgeon, R. A. Centrifugal separators. 11353. April 27.
- Carbide and Carbon Chemicals Corporation. Process of oxidising dibenzyl. 11110. April 24. (United States, May 4, 1922.)
- Christensen, C. P. Manufacture of calcareous and nitrogenous fertilizers. 11000. April 23. (Denmark, November 23, 1922.)
- Evans, E. V., and South Metropolitan Gas Co. Treating gases for removing carbon disulphide. 11526. April 28.
- Soc. of Chemical Industry in Basle. Manufacture of indigo dye-stuffs. 11431. April 27. (France, June 13, 1922.)

Market Report and Current Prices

Our Market Report and Current Prices are exclusive to THE CHEMICAL AGE, and, being independently prepared with absolute impartiality by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., may be accepted as authoritative. The prices given apply to fair quantities delivered ex wharf or works, except where otherwise stated. The current prices are given mainly as a guide to works managers, chemists, and chemical engineers; those interested in close variations in prices should study the market report.

London, May 2, 1923.

THE depression in the demand for chemicals which has been noticeable during the last week or two seems to be slowly passing off, and the demand, particularly in the textile districts, has improved.

Supplies from the Continent are still extremely light, but in the absence of any sustained demand prices remain practically stationary.

Export demand is also quiet.

General Chemicals

ACETONE maintains its value, and is in slightly better supply. ACID ACETIC is unchanged, and demand has been better. ACID CITRIC has further advanced, and good business has been placed.

ACID FORMIC.—Only a moderate business is reported, and prices are maintained.

ACID LACTIC is in good demand, but unchanged in value.

ACID OXALIC is in fair request, but the price is inclined to be still easier.

ACID TARTARIC is very firm and a good business has been done, especially on export account.

ARSENIC maintains its firmness in all positions.

BARIUM CHLORIDE continues quiet, and the price is unchanged.

CREAM OF TARTAR is very firm, and some substantial orders have been placed.

FORMALDEHYDE is quietly steady, and supplies are light.

LEAD ACETATE is in moderate demand, without change in value.

BROWN LEAD ACETATE is exceedingly scarce and in good request on export account.

LITHOPONE is firm, with light supplies from the Continent.

METHYL ALCOHOL maintains its value, and is in light supply for the better qualities.

POTASSIUM CARBONATE is firm and scarce.

POTASSIUM CAUSTIC is only in quiet request, but the price is maintained.

POTASSIUM PERMANGANATE seems to have reached the top for the time being, but business is still relatively good.

POTASSIUM PRUSSIAN is moving freely at current figures.

SODIUM ACETATE is scarce and firm.

SODIUM BICHROMATE is a firm market, and foreign quotations now approximate to that of the British makers.

SODIUM HYPOSULPHITE is steady and in good demand.

SODIUM NITRITE price is maintained, but the demand is only moderate.

SODIUM PHOSPHATE is firm and in slightly better request.

SODIUM PRUSSIAN is again lower in the absence of any substantial demand.

ZINC OXIDE is scarce and firm.

Pharmaceutical Chemicals

ACETYL SALICYLIC ACID remains a firm market; considerable business is reported.

BARBITONE continues in short supply and is slightly higher on the week.

BROMIDES.—The strong position on the Continent is gradually affecting the London market, advanced prices now being asked by most holders.

HEXAMINE is in fairly good demand, the tendency being slightly easier.

METOL.—The cheaper parcels having apparently passed into consumption, the market is firm, and higher prices are expected.

MILK SUGAR is quiet and slightly easier.

PARALDEHYDE is in good demand; market firm.

PHENACETIN.—Next to nothing is arriving from the Continent.

The market is active with an upward tendency.

RESORCIN is firmer, with steady inquiry.

SALICYLATES.—Makers are sold well ahead. Deliveries coming to hand find a ready market. Prices tend upward.

Coal Tar Intermediates

Business has broadened slightly, and there is now distinctly a more hopeful outlook as regards export trade.

ALPHA NAPHTHOL.—Some small business is passing, and the price is firm.

ALPHA NAPHTHYLAMINE has been inquired for on export account.

ANILINE OIL remains steady.

BENZIDINE BASE.—There is only a moderate market and the price is fairly easy.

BETA NAPHTHOL.—The demand is moderate.

DIMETHYLANILINE.—Small home trade business.

DINITROCHLOROBENZOL has been inquired for, both on home and on export account.

DIPHENYLAMINE remains steady.

NAPHTHIONIC ACID is unchanged.

NEVILLE WINTER ACID.—Some business has been placed.

NITROBENZOL is firmer and in fair request.

PARANITRANILINE is quiet.

PARAPHENYLENEDIAMINE is steady.

XYLIDINE.—Inquiries on export account.

Coal Tar Products

The steady tone of the market generally for coal tar products is well maintained.

90% BENZOL is steady at 1s. 7d. per gallon on rails.

PURE BENZOL has a little inquiry, and is quoted at about 2s. 1d. per gallon on rails in the north, and 2s. 4d. to 2s. 5d. per gallon in the south.

CREOSOTE OIL is moderately firm at 8½d. to 8¾d. per gallon on rails in the north, while the price in the south is from 9d. to 9½d. per gallon.

CRESYLIC ACID is steady at 2s. 2d. to 2s. 3d. per gallon on rails for the pale quality 97/99%, while dark 95/97% is worth 1s. 10d. to 1s. 11d. per gallon on rails.

SOLVENT NAPHTHA is very quiet, and is worth about 1s. 4d. per gallon on rails.

HEAVY NAPHTHA is also in poor demand, and is quoted at 1s. 4d. per gallon on rails.

NAPHTHALENES are firm, the better qualities being worth about £14 10s. to £15 per ton, while the lower melting points are worth from £9 to £11 per ton.

PITCH.—In the absence of demand, prices are somewhat easier, both for prompt shipment and for next season. To-day's quotations are as follows: Prompt—180s. to 185s., f.o.b., London; 175s. to 180s., f.o.b., East Coast. Next season—150s. per ton, f.o.b., London; 140s. to 145s. per ton, f.o.b., East Coast.

Sulphate of Ammonia

The market is unchanged.

[Current Market Prices on following pages.]

French Potash

As the fertiliser season is now drawing to a close the market in French potash salts has shown less activity during the past week. A review of the spring trade indicated that while expectations with regard to the demand for sylvinites have been fully realised, sales in the concentrated grades have been less satisfactory this year. At present a certain volume of trade is passing in 14 per cent. and 20 per cent., but it is expected that the later districts will soon complete their requirements. In some districts interest is also being taken in the special grade finely ground kainit for charlock destruction, supplies of which are now available. The French potash mines are sending out ample supplies of all grades, and trade abroad remains firm.—*French Potash Mines Bureau.*

Current Market Prices

General Chemicals

	Per	£	s.	d.	£	s.	d.	
Acetic anhydride.....	lb.	0	1	7	to	0	1	9
Acetone oil.....	ton	90	0	0	to	95	0	0
Acetone, pure.....	ton	125	0	0	to	130	0	0
Acid, Acetic, glacial, 99-100%.....	ton	69	0	0	to	70	0	0
Acetic, 80% pure.....	ton	48	0	0	to	50	0	0
Acetic, 40% pure.....	ton	25	0	0	to	26	0	0
Arsenic, liquid, 2000 s.g.....	ton	100	0	0	to	105	0	0
Boric, cryst.....	ton	55	0	0	to	60	0	0
Carbolic, cryst. 39-40%.....	lb.	0	1	8	to	0	1	9
Citric.....	lb.	0	1	10	to	0	1	10½
Formic, 80%.....	ton	52	10	0	to	53	0	0
Hydrofluoric.....	lb.	0	0	7½	to	0	0	8½
Lactic, 50 vol.....	ton	41	0	0	to	43	0	0
Lactic, 60 vol.....	ton	43	0	0	to	44	0	0
Nitric, 80 Tw.....	ton	27	0	0	to	28	0	0
Oxalic.....	lb.	0	0	6½	to	0	0	6½
Phosphoric, 1.5.....	ton	35	0	0	to	38	0	0
Pyrogallic, cryst.....	lb.	0	5	9	to	0	6	0
Salicylic, Technical.....	lb.	0	1	9	to	0	2	0
Sulphuric, 92-93%.....	ton	6	0	0	to	7	0	0
Tannic, commercial.....	lb.	0	2	3	to	0	2	9
Tartaric.....	lb.	0	1	5	to	0	1	5½
Alum, lump.....	ton	12	10	0	to	13	0	0
Chrome.....	ton	28	0	0	to	29	0	0
Alumino ferric.....	ton	9	0	0	to	9	5	0
Aluminium, sulphate, 14-15%.....	ton	8	10	0	to	9	0	0
Sulphate, 17-18%.....	ton	10	10	0	to	11	0	0
Ammonia, anhydrous.....	lb.	0	1	6	to	0	1	8
880.....	ton	32	0	0	to	34	0	0
920.....	ton	22	0	0	to	24	0	0
Carbonate.....	lb.	0	0	4	to	0	0	4½
Chloride.....	ton	50	0	0	to	55	0	0
Muriate (galvanisers).....	ton	35	0	0	to	37	10	0
Nitrate (pure).....	ton	35	0	0	to	40	0	0
Phosphate.....	ton	68	0	0	to	70	0	0
Sulphocyanide, commercial 90% lb.	0	1	1	0	to	0	1	3
Amyl acetate.....	ton	175	0	0	to	185	0	0
Arsenic, white powdered.....	ton	75	0	0	to	78	0	0
Barium, carbonate, Witherite.....	ton	5	0	0	to	6	0	0
Carbonate, Precip.....	ton	15	0	0	to	16	0	0
Chlorate.....	ton	65	0	0	to	70	0	0
Chloride.....	ton	17	0	0	to	17	10	0
Nitrate.....	ton	33	0	0	to	35	0	0
Sulphate, blanc fixe, dry.....	ton	20	10	0	to	21	0	0
Sulphate, blanc fixe, pulp.....	ton	10	5	0	to	10	10	0
Sulphocyanide, 95%.....	lb.	0	1	0	to	0	1	1
Bleaching powder, 35-37%.....	ton	10	10	0	to	11	0	0
Borax crystals.....	ton	28	0	0	to	32	0	0
Calcium acetate, Brown.....	ton	11	10	0	to	12	0	0
Grey.....	ton	19	15	0	to	20	0	0
Carbide.....	ton	16	0	0	to	17	0	0
Chloride.....	ton	6	0	0	to	7	0	0
Carbon bisulphide.....	ton	35	0	0	to	40	0	0
Casein technical.....	ton	100	0	0	to	105	0	0
Cerium oxalate.....	lb.	0	3	0	to	0	3	6
Chromium acetate.....	lb.	0	1	1	to	0	1	3
Cobalt acetate.....	lb.	0	6	0	to	0	6	6
Oxide, black.....	lb.	0	9	6	to	0	10	0
Copper chloride.....	lb.	0	1	2	to	0	1	3
Sulphate.....	ton	27	0	0	to	28	0	0
Cream Tartar, 98-100%.....	ton	92	10	0	to	95	0	0
Epsom salts (see Magnesium sulphate)								
Formaldehyde, 40% vol.....	ton	90	0	0	to	92	10	0
Formusol (Rongalite).....	lb.	0	2	1	to	0	2	2
Glauber slats, commercial.....	ton	5	0	0	to	5	10	0
Glycerin crude.....	ton	65	0	0	to	67	10	0
Hydrogen peroxide, 12 vols.....	gal	0	2	2	to	0	2	3
Iron perchloride.....	ton	28	0	0	to	30	0	0
Sulphate (Copperas).....	ton	3	10	0	to	4	0	0
Lead acetate, white.....	ton	43	0	0	to	45	0	0
Carbonate (White Lead).....	ton	45	0	0	to	48	0	0
Nitrate.....	ton	44	10	0	to	45	0	0
Litharge.....	ton	45	0	0	to	46	0	0
Lithophone, 30%.....	ton	22	10	0	to	23	0	0
Magnesium chloride.....	ton	5	10	0	to	6	0	0
Carbonate, light.....	cwt.	2	10	0	to	2	15	0
Sulphate (Epsom salts commercial)	ton	6	10	0	to	7	0	0
Sulphate (Druggists').....	ton	10	0	0	to	11	0	0
Manganese Borate, commercial.....	ton	65	0	0	to	75	0	0
Sulphate.....	ton	58	0	0	to	60	0	0
Methyl acetone.....	ton	78	0	0	to	80	0	0
Alcohol, 1% acetone.....	ton	105	0	0	to	110	0	0
Nickel sulphate, single salt.....	ton	41	0	0	to	42	0	0
Ammonium sulphate, double salt ton	41	0	0	to	42	0	0	

	Per	£	s.	d.	£	s.	d.	
Potash, Caustic.....	ton	35	0	0	to	36	0	0
Potassium bichromate.....	lb.	0	0	5½	to	0	0	6
Carbonate, 90%.....	ton	31	0	0	to	32	0	0
Chloride, 80%.....	ton	9	10	0	to	10	10	0
Chlorate.....	lb.	0	0	4½	to	0	0	4½
Metabisulphite, 50-52%.....	ton	80	0	0	to	85	0	0
Nitrate, refined.....	ton	43	0	0	to	45	0	0
Permanganate.....	lb.	0	0	10½	to	0	0	11
Prussiate, red.....	lb.	0	4	3	to	0	4	4
Prussiate, yellow.....	lb.	0	1	4½	to	0	1	5
Sulphate, 90%.....	ton	10	10	0	to	11	0	0
Salammoniac, firsts.....	cwt.	3	3	0	to	—	—	—
Seconds.....	cwt.	3	0	0	to	—	—	—
Sodium acetate.....	ton	24	15	0	to	25	0	0
Arsenate, 45%.....	ton	48	0	0	to	50	0	0
Bicarbonate.....	ton	10	10	0	to	11	0	0
Bichromate.....	lb.	0	0	4½	to	0	0	4½
Bisulphite, 60-62%.....	ton	21	0	0	to	23	0	0
Chlorate.....	lb.	0	0	3½	to	0	0	3½
Caustic, 70%.....	ton	19	10	0	to	20	0	0
Caustic, 76%.....	ton	20	10	0	to	21	0	0
Hydrosulphite, powder.....	lb.	0	1	5	to	0	1	6
Hypsulphite, commercial.....	ton	10	10	0	to	11	0	0
Nitrite, 96-98%.....	ton	28	0	0	to	29	0	0
Phosphate, crystal.....	ton	16	10	0	to	17	0	0
Perborate.....	lb.	0	1	0	to	0	1	1
Prussiate.....	lb.	0	0	8	to	0	0	8½
Sulphide, crystals.....	ton	10	10	0	to	11	0	0
Sulphide, solid, 60-62%.....	ton	16	10	0	to	17	10	0
Sulphite, cryst.....	ton	12	10	0	to	13	0	0
Strontium carbonate.....	ton	50	0	0	to	55	0	0
Nitrate.....	ton	40	0	0	to	42	0	0
Sulphate, white.....	ton	6	10	0	to	7	10	0
Sulphur chloride.....	ton	25	0	0	to	27	10	0
Flowers.....	ton	11	10	0	to	12	10	0
Roll.....	ton	11	0	0	to	12	0	0
Tartar emetic.....	lb.	0	1	2	to	0	1	3
Tin perchloride, 33%.....	lb.	0	1	2	to	0	1	4
Perchloride, solid.....	lb.	0	1	5	to	0	1	7
Protochloride (tin crystals).....	lb.	0	1	4	to	0	1	5
Zinc chloride 102° Tw.....	ton	21	0	0	to	22	10	0
Chloride, solid, 96-98%.....	ton	25	0	0	to	30	0	0
Oxide, 99%.....	ton	40	0	0	to	42	0	0
Dust, 90%.....	ton	45	0	0	to	47	10	0
Sulphate.....	ton	16	0	0	to	17	0	0

Pharmaceutical Chemicals

Acetyl salicylic acid.....	lb.	0	3	3	to	0	3	6
Acetanilid.....	lb.	0	1	6	to	0	1	9
Acid, Gallic, pure.....	lb.	0	3	0	to	0	3	3
Lactic, 1.21.....	lb.	0	2	9	to	0	3	0
Salicylic, B.P.....	lb.	0	2	2	to	0	2	6
Tannic, lewiss.....	lb.	0	3	4	to	0	3	6
Amidol.....	lb.	0	8	3	to	0	8	6
Amidopyrin.....	lb.	0	13	3	to	0	13	6
Ammon ichthosulphonate.....	lb.	0	2	0	to	0	2	3
Barbitone.....	lb.	0	18	6	to	0	19	0
Beta naphthol resublimed.....	lb.	0	1	9	to	0	2	0
Bromide of ammonia.....	lb.	0	0	9	to	0	0	10
Potash.....	lb.	0	0	8½	to	0	0	9
Soda.....	lb.	0	0	9	to	0	0	9½
Caffeine, pure.....	lb.	0	12	0	to	0	12	3
Calcium glycerophosphate.....	lb.	0	5	9	to	0	6	0
Lactate.....	lb.	0	2	0	to	0	2	3
Calomel.....	lb.	0	4	9	to	0	5	0
Chloral hydrate.....	lb.	0	3	10½	to	0	4	0
Cocaine alkaloid.....	oz.	0	18	0	to	0	18	6
Hydrochloride.....	oz.	0	14	9	to	0	15	0
Corrosive sublimate.....	lb.	0	4	3	to	0	4	6
Eucalyptus oil, B.P. (70-75% eucalyptol).....	lb.	0	1	6	to	0	1	6½
B.P. (75-80% eucalyptol).....	lb.	0	1	7	to	0	1	7½
Guaiacol carbonate.....	lb.	0	8	6	to	0	8	9
Liquid.....	lb.	0	9	6	to	0	10	0
Pure crystals.....	lb.	0	10	3	to	0	10	6
Hexamine.....	lb.	0	4	3	to	0	4	6
Hydroquinone.....	lb.	0	3	9	to	0	4	0
Lanoline anhydrous.....	lb.	0	0	7	to	0	0	7½
Lecithin ex ovo.....	lb.	0	18	6	to	0	1	0
Lithi carbonate.....	lb.	0	9	6	to	0	10	0
Methyl salicylate.....	lb.	0	2	6	to	0	2	10
Metol.....	lb.	0	10	6	to	0	11	6
Milk sugar.....	cwt.	4	12	6	to	4	15	0
Paraldehyde.....	lb.	0	1	6	to	0	1	9
Phenacetin.....	lb.	0	6	0	to	0	6	6
Phenazone.....	lb.	0	7	9	to	0	8	0
Phenolphthalein.....	lb.	0	5	6	to	0	5	9
Potassium sulpho guaiacolate.....	lb.	0	5	0	to	0	5	3
Quinine sulphate, B.P.....	oz.	0	2	3	to	—	—	—

	Per	£	s.	d.	to	£	s.	d.
Resorcine, medicinal.....lb.	0	5	6	to	0	5	9	
Salicylate of soda powder.....lb.	0	2	6	to	0	2	9	
Crystals.....lb.	0	2	9	to	0	3	0	
Salol.....lb.	0	2	9	to	0	3	0	
Soda Benzoate.....lb.	0	2	3	to	0	2	6	
Sulphonal.....lb.	0	14	0	to	0	14	6	
Terpene hydrate.....lb.	0	1	9	to	0	2	0	
Theobromine, pure.....lb.	0	12	0	to	0	12	6	
Soda salicylate.....lb.	0	7	9	to	0	8	3	
Vanillin.....lb.	1	3	6	to	1	4	6	

Coal Tar Intermediates, &c.

Alphanaphthol, crude.....lb.	0	2	0	to	0	2	3	
Refined.....lb.	0	2	6	to	0	2	9	
Alphanaphthylamine.....lb.	0	1	6	to	0	1	7	
Aniline oil, drums extra.....lb.	0	0	9	to	0	0	10	
Salts.....lb.	0	0	9	to	0	0	10	
Anthracene, 40-50%.....unit	0	0	8	to	0	0	9	
Benzaldehyde (free of chlorine).....lb.	0	3	0	to	0	3	3	
Benidine, base.....lb.	0	5	0	to	0	5	3	
Sulphate.....lb.	0	3	9	to	0	4	0	
Benzoic acid.....lb.	0	2	0	to	0	2	3	
Benzyl chloride, technical.....lb.	0	2	0	to	0	2	3	
Betanaphthol.....lb.	0	1	1	to	0	1	2	
Betanaphthylamine, technical.....lb.	0	4	0	to	0	4	3	
Croceine Acid, 100% basis.....lb.	0	3	3	to	0	3	6	
Dichlorobenzol.....lb.	0	0	9	to	0	0	10	
Diethylaniline.....lb.	0	4	6	to	0	4	9	
Dinitrobenzol.....lb.	0	1	1	to	0	1	2	
Dinitrochlorbenzol.....lb.	0	0	11	to	0	1	0	
Dinitronaphthalene.....lb.	0	1	4	to	0	1	5	
Dinitrotoluenol.....lb.	0	1	4	to	0	1	5	
Dinitrophenol.....lb.	0	1	7	to	0	1	9	
Dimethylaniline.....lb.	0	3	0	to	0	3	3	
Diphenylamine.....lb.	0	3	9	to	0	4	0	
H-Acid.....lb.	0	5	0	to	0	5	3	
Metaphenylenediamine.....lb.	0	4	0	to	0	4	3	
Monochlorbenzol.....lb.	0	0	10	to	0	1	0	
Metanilic Acid.....lb.	0	5	9	to	0	6	0	
Metatoluylenediamine.....lb.	0	4	0	to	0	4	3	
Monosulphonic Acid (2.7).....lb.	0	5	6	to	0	6	0	
Naphthionic acid, crude.....lb.	0	2	3	to	0	2	6	
Naphthionate of Soda.....lb.	0	2	6	to	0	2	9	
Naphthylamin-di-sulphonic acid.....lb.	0	4	0	to	0	4	3	
Nevill Winther Acid.....lb.	0	7	3	to	0	7	9	
Nitrobenzol.....lb.	0	0	8	to	0	0	8	
Nitronaphthalene.....lb.	0	1	0	to	0	1	1	
Nitrotoluenol.....lb.	0	0	8	to	0	0	9	
Orthoamidophenol base.....lb.	0	12	0	to	0	12	6	
Orthodichlorbenzol.....lb.	0	1	0	to	0	1	1	
Orthotoluidine.....lb.	0	0	10	to	0	0	11	
Orthonitrotoluenol.....lb.	0	0	3	to	0	0	4	
Para-amidophenol, base.....lb.	0	8	6	to	0	9	0	
Hydrochlor.....lb.	0	7	6	to	0	8	0	
Paradichlorbenzol.....lb.	0	0	6	to	0	0	7	
Paranitraniline.....lb.	0	2	7	to	0	2	9	
Paranitrophenol.....lb.	0	2	3	to	0	2	6	
Paranitrotoluenol.....lb.	0	2	9	to	0	3	0	
Paraphenylenediamine, distilled.....lb.	0	12	0	to	0	12	6	
Paratoluidine.....lb.	0	5	9	to	0	6	3	
Phthalic anhydride.....lb.	0	2	6	to	0	2	9	
Resorcin, technical.....lb.	0	4	0	to	0	4	3	
Sulphanilic acid, crude.....lb.	0	0	10	to	0	0	11	
Tolidine, base.....lb.	0	7	3	to	0	7	9	
Mixture.....lb.	0	2	6	to	0	2	9	

Essential Oils and Synthetics

These markets still keep very quiet, and the only change to report is that lemongrass oil is a little easier at 2½d. per oz. All the other prices remain the same as last week.

	ESSENTIAL OILS.	£	s.	d.
Anise.....c.i.f. 1/10 spot		0	2	0
Bay.....		0	12	0
Bergamot.....		0	12	0
Cajaput.....		0	3	9
Camphor, white.....per cwt.		4	0	0
Brown.....		3	15	0
Cassia.....c.i.f. 7/9 spot		0	8	3
Cedarwood.....		0	1	6
Citronella (Ceylon).....		0	3	2
(Java).....		0	4	0
Clove.....		0	7	6
Eucalyptus.....		0	1	6
Geranium Bourbon.....		1	8	0
Lavender.....		0	12	6
Lavender spike.....		0	3	0
Lemon.....		0	3	0

Lemongrass.....per oz.	£	s.	d.
Lime (distilled).....	0	0	2½
Orange sweet (Sicilian).....firmer	0	3	3
(West Indian).....	0	11	0
Palmarosa.....	0	9	6
Peppermint (American).....	0	17	6
Mint (dem. ntolised Japanese).....	0	13	0
Patchouli.....	0	6	3
Otto of Rose.....per oz.	1	12	0
Rosemary.....	1	4	0
Sandalwood.....	0	1	8
Sassafras.....	1	6	0
Thyme.....according to quality 2/6 to	0	5	0
	0	8	0

SYNTHETICS.

Benzyl acetate.....	0	3	0
Benzoate.....	0	3	0
Citral.....	0	10	0
Coumarine.....	0	15	0
Heliotropine.....	0	7	0
Ionone.....	1	5	0
Lianlyl acetate.....	1	2	6
Methyl salicylate.....	0	2	6
Musk xylol.....	0	9	0
Terpeniol.....	0	3	1

Promising Results with Insulin

THE *British Medical Journal* has published a general summary of the clinical experiences of workers in whose hostels (eight in number) in England and Scotland who during the last few months have been able to treat certain selected cases of diabetes with insulin prepared under the directions of the Medical Research Council in the laboratories of the medical schools attached to each hospital. Recently insulin prepared by commercial firms has also been used by these workers. So far, at each hospital, two or three patients suffering from severe diabetes have been selected, and the effects of insulin upon them has been very closely studied week by week. Except in cases which have already reached the stage of coma, all the patients treated, it is stated, have shown admirable improvement, just as was described by the Canadian workers.

Proposed Colouring of Poisons

WRITING on the proposed colouring of strychnine with brilliant green, Mr. James Sexton, M.P., states that twelve months ago there would have been a question as to whether the suggestion was practicable. "There would have been a risk," he writes, "not worth the running had the selected colour not remained under all conditions the same; nor had the colour to be of such a nature as to interfere with the work of the analyst, and so prevent the subsequent identification of the particular poison with which it was associated. Collaboration by British dyestuffs experts with members of the Pharmaceutical Society has removed these objections as far as strychnine is concerned. The action of re-agents on the dye," say the latter, "is not likely, in our opinion, to prove inconvenient to dispensers or to the public."

Import of Chemicals into Guatemala

THE Acting British Vice-Consul at Guatemala reports that by virtue of an Ordinance, dated December 30th, 1922, and published in the *Official Gazette* of January 23rd last, certain chemical and medicinal substances may be imported by persons not licensed as pharmacists or druggists. A list of such chemical and medicinal substances is available, and may be consulted by United Kingdom firms interested on application to the Department of Overseas Trade, 35, Old Queen Street, London, S.W.1. (Reference 7683/F.L.).

Glass Trade Wages Dispute

IN regard to the wages dispute in the glass trade, it is reported that, as a result of the recent conference in Birmingham, called by Mr. George Ryder, Chief Conciliation Officer, Ministry of Labour, Birmingham, the manufacturers have reduced their demand. The new proposals will be submitted to the operatives, whose decision is to be conveyed to the manufacturers as early as possible. There is a feeling that the proposals will form the basis of a satisfactory settlement.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.

Glasgow, May 2, 1923.

WHILST the actual number of orders booked has not been large, the heavy chemical market has shown a livelier tendency during the past week, a good number of inquiries both for home and export being received.

Prices quoted for home products are steady, with continental quotations slightly lower.

Industrial Chemicals

ACID, ACETIC.—Glacial 98/100%, £62 to £68 per ton; 80% pure, £47 to £48 per ton; 80% technical, £45 to £47 per ton, c.i.f. U.K.

ACID, BORACIC.—Crystal or granulated, £55 per ton; powdered £57 per ton, carriage paid U.K. stations.

ACID, CARBOLIC.—Ice crystals quoted 1s. 7d. per lb.

ACID, FORMIC, 80%.—Price steady at about £56 per ton, ex store.

ACID, HYDROCHLORIC.—Unchanged at 6s. 6d. per carboy, ex works.

ACID, NITRIC, 84%.—£27 10s. per ton, ex station, full truck loads.

ACID, OXALIC.—In little demand. Offered at 6½d. per lb., ex store.

ACID, SULPHURIC.—144°, £3 15s. per ton; 168°, £7 per ton, ex works, full loads. De-arsenicated quality £1 per ton more.

ACID, TARTARIC.—In moderate request at 1s. 2½d. per lb.

ALUM, LUMP POTASH.—Spot lots about £12 10s. per ton, ex store. Offered from Continent at £10 5s., c.i.f.

ALUM, CHROME.—Offered at £28 per ton, f.o.b. U.K.

ALUMINIUM SULPHATE.—14/15% continental make, £9 5s. per ton; 17/18%, £11 15s. per ton, ex wharf, early delivery.

AMMONIA, ANHYDROUS.—Remains unchanged at 1s. 6d. per lb.

AMMONIA, CARBONATE.—Lump, 4d. per lb.; ground, 4½d. per lb., delivered.

AMMONIA, LIQUID, 880°.—Quoted 3½d. per lb., delivered.

AMMONIA, MURIATE.—Grey galvanisers quality, £32 to £33 per ton, f.o.r. works; fine white crystals offered from Continent at £28 10s. per ton, c.i.f.

AMMONIA, SULPHATE.—25½%, £15 10s. per ton; 25¼% neutral, £16 13s. per ton, ex works, May delivery.

ARSENIC, WHITE POWDERED.—In little request. Price maintained at about £76 per ton, ex store.

BARIUM CHLORIDE, 98/100%.—Spot lots of English make about £17 10s. per ton, ex store.

BARYTES.—Finest white English quoted £5 5s. per ton, ex works, prompt delivery.

BLEACHING POWDER.—Makers advise reduction of 2s. 6d. per ton as from 1st inst. Now £11 7s. 6d. per ton, ex station, spot delivery. Contracts 20s. per ton less.

BORAX.—Crystal or granulated, £28 per ton; powdered, £29 per ton, carriage paid U.K. stations.

CALCIUM CHLORIDE.—Reduction of 2s. 6d. per ton in price of English make as from 1st inst. Now £5 12s. 6d. per ton, ex quay or station.

COPPERAS, GREEN.—Price about £2 10s. to £2 15s., f.o.b. U.K.

FORMALDEHYDE 40%.—Quoted £86 10s. per ton, ex wharf.

GLAUBER SALTS.—Fine white crystals, £3 17s. 6d. per ton, ex store.

LEAD, RED.—English make reduced by £1 per ton. Now £41 per ton, carriage paid U.K. Continental material about £36 per ton, ex store.

LEAD, ACETATE.—White crystals. Spot lots still offered at £41 per ton, ex store.

MAGNESITE, GROUND CALCINED.—Unchanged at £8 10s. per ton, ex station.

MAGNESIUM CHLORIDE.—Spot lots about £4 to £4 5s. per ton. Quoted £2 17s. 6d. per ton, c.i.f. U.K., early delivery.

MAGNESIUM SULPHATE (EPSOM SALTS).—Commercial, £7 per ton; B.P. crystals, £8 10s. per ton, delivered. B.P. for export £6 10s. per ton.

POTASH, CAUSTIC, 88/92%.—Now quoted £35 10s. per ton, ex store, spot delivery.

POTASSIUM BICHROMATE.—Unchanged at 5½d. per lb. delivered.

POTASSIUM CARBONATE.—96/98%, about £34 to £35, per ton, ex store; 90/92%, £29 to £30 per ton, ex store. Little inquiry.

POTASSIUM CHLORATE.—Unchanged at 3d. per lb.

POTASSIUM NITRATE (SALTPETRE).—Nominally £32 per ton, but in little demand.

POTASSIUM PERMANGANATE.—Commercial crystals now about 10½d. per lb.; B.P. crystals scarce at about 11½d. per lb.

POTASSIUM PRUSSIAN (YELLOW).—In little request. Now quoted 1s. 5d. per lb. ex store.

SODA, CAUSTIC.—Makers intimate a reduction of 2s. 6d. per ton from 1st inst.; 76/77%, £21 7s. 6d. per ton; 70/72%, £19 17s. 6d. per ton; 60/62% broken, £21 2s. 6d. per ton; 98/99% powdered, £24 15s. per ton, ex station, spot delivery.

SODIUM ACETATE.—Spot material hard to obtain. Offered for early delivery at £25 10s. per ton.

SODIUM BICARBONATE.—Refined recrystallised quality, £10 10s. per ton, ex quay or station; M.W. quality, 30s. per ton less.

SODIUM BICHROMATE.—Unchanged at 4½d. per lb. delivered.

SODIUM CARBONATE.—Soda crystals, £5 to £5 5s. per ton, ex quay or station; alkali, 58%, £8 17s. 6d. per ton, ex quay or station.

SODIUM CHLORATE.—Now offered at 2½d. per lb., ex store.

SODIUM HYPOSULPHITE.—Commercial, about £10 10s. per ton; pea crystals, £15 10s. per ton, ex station.

SODIUM NITRATE, 96/98%.—Unchanged at £13 10s. per ton, f.o.r. or f.o.b. U.K.

SODIUM NITRITE, 100%.—£27 to £29 per ton, according to quantity.

SODIUM PRUSSIAN (YELLOW).—In little request. Quoted 8½d. per lb. delivered.

SODIUM SULPHATE (SALTCAKE, 95%).—Home price unchanged at £4 per ton, carriage paid station. Higher prices for export.

SODIUM SULPHIDE, 60/62%.—Quoted £15 10s. to £16 per ton, solid in drums; broken, 20s. per ton more.

SULPHUR.—Flowers, £10 per ton; roll, £9 per ton; rock, £9 per ton; ground, £8 per ton. Prices nominal.

TIN, CRYSTALS.—Now quoted 1s. 4d. per lb.

ZINC SULPHATE.—White commercial, £14 to £15 per ton.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Coal Tar Intermediates and Wood Distillation Products

ALPHA NAPHTHYLAMINE.—Fair export inquiry. 1s. 6½d. per lb. f.o.b. U.K. port, packages free.

ACETANILIDE.—Export inquiry. Price 1s. 10d. per lb. 100% basis, f.o.b. U.K. port, casks free.

ACETINE.—Price quoted 3/7d. per lb. f.o.b., packages extra.

ANTHRANILIC ACID.—Export inquiry. Price quoted 10s. per lb. 100% basis, f.o.b. U.K. port, packages free.

BETA OXYNAPHTHOIC ACID.—Small inquiry. Offered at 10s. per lb. delivered, packages free.

BETA NAPHTHYLAMINE.—Home inquiry. Price quoted 4s. per lb. delivered, casks included.

BETA NAPHTHOL.—Fair export inquiry. Price 1s. 1d. per lb. f.o.b., casks free.

CLEVES ACID.—Export inquiry. Price quoted 4s. per lb. 100% basis f.o.b. U.K. port, casks included.

DIPHENYLAMINE.—Export inquiry. Price quoted 3s. 9d. per lb. f.o.b. U.K., packages free.

DIMETHYLANILINE.—Very scarce. In strong demand. Price 3s. per lb. delivered, drums returnable.

H ACID.—Fair inquiry. Price quoted 5s. per lb. 100% basis, delivered f.o.b., packages free.

NITRO ANISIDINE.—Some inquiry. Price quoted 7s. per lb. f.o.r. maker's works, casks included.

ORTHO TOLUIDINE.—Small inquiry. Price quoted 1s. 3d. per lb., drums returnable.
 PARANITRANILINE.—Some inquiry for export. 2s. 7d. per lb. f.o.b., packages free.
 PHTHALIC ACID ANHYDRIDE.—Price quoted 2s. per lb., carriage paid, casks free.
 PICRIC ACID.—Offered at 1s. 6d. per lb. dry basis, carriage paid, packages free.
 R R ACID.—Fair inquiry. Price quoted 17s. 6d. per lb. 100% basis, carriage paid, casks free.

Manchester Chemical Market

(FROM OUR OWN CORRESPONDENT.)

Manchester, May 3, 1923.

BUSINESS on the chemical market here has been maintained at a fairly good level. Home-consuming industries are taking steady supplies, and for export also there is a reasonably satisfactory sale for certain of the principal products. Prices on the whole keep firm, though here and there a slight easing of values is to be observed. On Tuesday a cut of 2s. 6d. per ton in the price of bleaching powder was put into operation by the makers.

Heavy Chemicals

The home and foreign demand for caustic soda keeps up well and prices are firm at from £19 for 60 per cent. to £21 10s. per ton for 76-77 per cent. strength. Bleaching powder is also active both on home and export account; with the reduction which came into effect from the beginning of the month the price to home consumers is now £11 7s. 6d. per ton. Soda crystals still meet with only a subdued demand, though the quotation is unchanged at £5 5s. per ton delivered. Salt-cake is being actively called for by home users and for shipment; home trade price is firm at £4 10s. per ton. Sodium sulphide keeps very quiet at £14 10s. to £15 per ton for 60-65 per cent. concentrated solid and £9 for crystals. Glauber salts are firm at £4 per ton, but little improvement in the demand can be reported. Bicarbonate of soda is steady and in moderate inquiry at £10 10s. per ton delivered to home users. Sellers still report a good home and foreign demand for alkali; the price is steady at £7 12s. 6d. per ton to home users for 58 per cent. material. Hyposulphite of soda is firm at £15 per ton for photographic crystals and £10 for commercial, but the demand continues quiet. Nitrite of soda is also a rather quiet section at £26 10s. per ton. Phosphate of soda is inactive, though the price is about maintained at £15 per ton. Chlorate of soda meets with a quietly steady demand and prices are firm at 2½d. to 3d. per lb. Prussiate of soda is quoted at round 8½d. per lb., without attracting a great deal of business. Bichromate of soda is steady and in moderate inquiry at 4½d. per lb. Acetate of soda is unchanged at £24 per ton, the demand still being quiet.

Caustic potash is a strong section of the market and prices are very steady at £34 per ton for 88-90 per cent. Carbonate of potash is firm and in good demand at £33 10s. per ton for 96-98 per cent. material. Bichromate of potash is being taken up steadily and prices are firm at 5½d. per lb. Yellow prussiate of potash keeps quiet, but prices have been maintained at last week's level of 1s. 5d. per lb. Chlorate of potash is steady and in fairly good demand at 3½d. per lb. Permanganate of potash is very firm at 10d. per lb.

The improvement in the export inquiry for sulphate of copper keeps up and prices are about unchanged at £26 10s. per ton. Arsenic is firm at round £75 per ton for white powdered, Cornish makes, on continued scarcity and export demand; foreign grades, however, are offering at under this figure. Commercial Epsom salts are steady and fairly active at £6 10s. per ton for British makes, with foreign quoted at about £4 10s.; magnesium sulphate, B.P., is unchanged at £7 per ton. Acetate of lime is in short supply at £20 for grey and £10 10s. per ton for brown. Nitrate of lead is in somewhat better demand at £43 10s. per ton. White sugar of lead keeps very firm at round £44 per ton, with brown quoted at about £40.

Acids and Tar Products

Both tartaric and citric acids are stronger and more active. Tartaric is now quoted at 1s. 3d. to 1s. 3½d. per lb. and citric,

B.P. crystals, at 1s. 9½d. Acetic acid is firm and in good demand at £70 for glacial and £47 to £48 per ton for 80 per cent. technical. Oxalic acid is quiet but steady at 6½d. to 7d. per lb.

Coal-tar products are again rather quiet. With the warmer weather exports of pitch are falling off and the quotation is decidedly easier at between £7 10s. and £8 per ton f.o.b. Manchester. Carbolic acid crystals are weaker at 1s. 5½d. and the demand is quiet; crude, 60 per cent, is now quoted down to 3s. 6d. per gallon. Benzole is firm at 1s. 8d. per gallon, but the demand is inactive. Solvent naphtha is quiet, but firm at 1s. 8d. to 1s. 9d. per gallon. Creosote oil is easier at 9½d. per gallon, but a moderate amount of business is being done. Refined naphthalene is firm at £20 per ton and crude at £6 to £13, the recent improvement in the volume of trade being maintained.

Sir S. W. Roysse and Co.'s Monthly Review

In their monthly review of the chemical market Sir S. W. Roysse and Co. state:—

"Since the Easter holidays a steady volume of business has been put through for both home and export, and in many cases higher prices have been realised. The moderate reductions in railway rates, which came into force on May 1, are disappointing to traders, and there is considerable pressure for further concessions. The demand for sulphate of copper has been irregular, home trade requirements have been only small, but some good business has been done for shipment; prices on the whole have been better, but they still leave little margin of profit for makers. The returns show 6,076 tons exported in March as against 6,664 tons for March, 1922, but for the first three months of this year 17,762 tons were shipped as against only 16,119 tons for the same period of 1922. Green copperas is unchanged. Supplies of acetates of lime are still small and prices nominal, whilst acetic acid is offering in only small quantities and at full rates. Acetates of lead have responded, and are appreciably dearer, but acetate of soda has been less affected. Good business continues to be done in nitrate of lead. Carbonate of potash continues firm with a steady demand. Caustic potash is well inquired for, and price has an upward tendency. Some falling away in demand for yellow prussiates of potash and soda has led to easier prices.

"The export inquiry continues for white powdered arsenic, but supplies are small with no change in values. Tartaric acid has been in active request through the interruption of supplies from Germany, stocks here have been reduced and a good trade done at better figures for both early and forward delivery. Cream of tartar also is firmer, but recent heavy importations are offering at low rates. Citric acid has advanced and is in a strong position. Bichromates have been moving freely on export account and home consumers have been coming for increased quantities. The call for chlorates of potash and soda has been poor, and there has been some decline in demand for nitrite of soda. Makers of borax and boracic acid have been well employed, but oxalic acid is dull. Muriate of ammonia has been in good request for export, but little doing in sal ammoniac, with some accumulation of stock. White caustic soda and bleaching powder have been in steady request and prices are reduced for spot and forward delivery from May 1.

"The market for tar products is quiet. Benzols and toluols are without much inquiry, with prices if anything easier. Solvent naphtha continues quiet, consumers still buying from hand to mouth and small orders on the market are keenly competed for. The overseas demand for creosote oil has fallen off, with consequent easing of values. Crude carbolic acid remains steady, but there is little demand for crystals. Crude naphthalenes are in better inquiry, and prices have hardened. In pitch there has been a decided falling away in Continental business, consumers being well covered for this season.

"The anticipated change in the Ruhr position, together with the German supplies just delivered to France and Belgium, have considerably strengthened consumers' ideas as to lower prices for next season. Little business is passing even at the reduced figures now being quoted. There is very little change in South Wales, where American pitch is arriving in large quantities."

Company News

ANTON JURGENS' UNITED (MARGARINE) WORKS.—The transfer books of the 6 per cent. cumulative participating "B" preference shares will be closed from May 5 to 14, inclusive. The net profit for 1922 was 9,000,000 guilders.

BRITISH GLASS INDUSTRIES, LTD.—To meet the convenience of shareholders resident abroad, the period during which shares in British Glass Industries, Ltd., may be exchanged for shares in British Glass Industries Consolidated, Ltd., has been extended to July 31 next.

SEAGER, EVANS AND CO., LTD.—It is announced that the directors have purchased the goodwill, together with the stock-in-trade, trade marks, agencies, and other assets of the firm of Robert Preston and Co., Liverpool. The acquisition will not involve any further increase of capital.

THE "SANITAS" CO., LTD.—A final dividend of $4\frac{1}{2}$ per cent., making a total of 9 per cent. per annum on the 9 per cent. cumulative preference shares, has been declared payable on and after June 1. The share transfer books of the company will be closed from May 18 to June 1, both days inclusive.

PARKE'S DRUG STORES.—The accounts for the year to February 28 last show a net available balance of £7,310. The directors propose a final dividend of 5 per cent. less tax on the ordinary shares, making $7\frac{1}{2}$ per cent. for the year, leaving £428 to be carried forward. Meeting, 65, Harwood Street, London, N.W., on May 9, at noon.

MAYPOLE MARGARINE WORKS.—The net profit for the past year was £50,222, and £4,689 was brought forward. The directors have paid a dividend on the 6 per cent. preference shares, and an interim dividend of 2s. per share on the ordinary shares, together with directors' fees £500, which leaves a deficit of £588 to be met out of next year's account.

VICKERS, LTD.—The directors have declared, subject to sanction in general meeting, a dividend for the year 1922 at the rate of 5 per cent. per annum, less tax, on the ordinary shares, payable on May 31. The transfer books of the 4 per cent. first mortgage debenture stock will be closed from May 11 to 31, inclusive, for the preparation of the interest warrants.

LAUTARO NITRATE CO., LTD.—It is proposed to increase the capital of the company to £4,000,000 by the creation of 730,000 ordinary shares of £5 each, and to capitalise the sum of £150,000, part of the reserve fund. Resolutions will be submitted to the shareholders at an extraordinary general meeting, to be held on Wednesday next, May 9, at River Plate House, Finsbury Circus, London, E.C.

SANTA RITA NITRATE CO.—The past year's trading shows a loss of £10,240, which has been carried to the debit of profit and loss account, leaving a credit on that account of £15,220, from which it is proposed to pay a dividend of 10 per cent., less tax. For the previous year 15 per cent. less tax was paid. The report states that the Oficina was reopened on December 15, 1922, and the working results have been very satisfactory.

ANGLO-CHILEAN NITRATE AND RAILWAY CO.—The profit for 1922, after providing for income tax, service of the mortgage bonds, stoppage expenses, etc., amounted to £19,721 (against £183,384 for 1921). With £190,507 brought forward, the available balance is £210,228. The directors propose a further distribution of 2s. per share, free of tax, making 15 per cent., free of tax, for the year, leaving £75,228 to be carried forward, subject to corporation tax.

BELL'S UNITED ASBESTOS CO., LTD.—The accounts for the year ended December 31 last show a net profit of £36,851, to which has to be added £34,013 brought forward, making a total of £70,864. After paying the dividend on the preference shares, the directors recommend a further dividend on the ordinary shares of 1s. 6d. per share, making a total distribution of 10 per cent. for the year, while the balance to be carried forward is £37,911. The ordinary general meeting of the shareholders will be held at the Cannon Street Hotel, London, E.C., on Thursday, May 10, at 2 p.m.

BURT, BOULTON AND HAYWOOD, LTD.—The company have issued "for information only," a statement that arrangements have been made for paying off on May 5 the whole of the first mortgage debentures, and that the debenture debt will be rearranged by the creation of first mortgage 5 per cent.

debentures not exceeding £200,000 in amount, and £50,000 6 per cent. second mortgage debentures. In addition to their important tar distillation and other chemical works in this country the company have a predominant interest in the Dominion Tar and Chemical Co., Ltd., and large interests in other creosoting and timber companies.

BRYANT AND MAY, LTD.—The net profit for the year to March 31 last was £273,523, against £208,135 for 1921. After providing for interim dividends, the directors propose to write off the discount, £52,500, on their issue of £750,000 of 5 per cent. debenture stock, and to pay a further dividend of 4 per cent., free of tax, on the ordinary shares, and a similar dividend on the partnership shares. Under the Brymay co-partnership scheme another 4 per cent., free of tax, is payable on the ordinary shares, making a total distribution of 12 per cent. for the year (against 11 per cent. for 1921), and after deducting employees' proportion, £37,240, a sum of £24,312 is carried forward. Meeting, Fairfield Works, Bow, E., on May 9, at 2.45 p.m.

Tariff Changes

BRITISH INDIA.—A revised Customs tariff has been issued which contains alterations in the import duty on sugars, saccharin, preparations containing spirit, and many kinds of machinery. Full particulars are given in the *Board of Trade Journal* for April 26.

FRANCE.—The *Journal Officiel* for April 13 contained a Ministerial Decree, dated April 12, which reimposed the prohibition on the export and re-export from France of sulphate of ammonia (Tariff Nos. 019 and 020).

POLAND.—The duty on acetic acid has been increased to 3,000 Polish marks per kilog. of undiluted acid, as from April 1.

English China Clays, Ltd.

At the annual general meeting of the company held on Monday, April 30, at the Institute of Chartered Accountants, Moorgate Place, London, Mr. R. Martin, chairman and managing director, said that the net profit for the past year amounted to £62,342, as compared with a loss of £32,102 in the previous year—an improvement of £94,444. This was a satisfactory result in view of the general depression which had been prevalent in both British and foreign trade throughout the period, and was the more gratifying when it was borne in mind that it had been achieved on an output of less than half of the normal capacity of the works. After reviewing the items in the balance-sheet, he said that there was a general feeling of optimism that the corner of bad trade had been turned, and that a gradual improvement was slowly, but surely, taking place. This was noticeable in the home paper and pottery trades, and was decidedly in evidence in the demand from America, where the consumption had almost reached the pre-war level. On the Continent, the adverse rates of exchange militated against any recovery of that market, though even there indications were not wanting that a settlement of the political difficulties would be promptly followed by an increased demand. The directors had had constantly in view the possibilities of colloidal clay in finding a new outlet for China Clay, and a licence had been obtained under the Osmosis process from which it was anticipated considerable development would evolve. They had not yet actually got to the producing stage, but they had made small sample tests and had submitted these to various probable users who had expressed themselves as highly pleased with the results so far. The necessary plant for dealing with these on a larger scale was being installed, and manufacture should be in operation in the course of a few weeks. The works of the company generally were in a highly efficient state.

Drugs and Chemicals for Roumania

THE British Vice-Consul at Timisoara (Mr. Szana) reports that a local firm is desirous of purchasing drugs and chemicals from British sources. The name and address of the firm, together with further particulars, may be obtained by British firms upon application to the Department of Overseas Trade, 35, Old Queen Street, London, S.W.1. (Reference No. 10543/F.E./C./2.)

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All communications should be
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The British Alizarine Co., Ltd.
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Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

Bills of Sale

ALLPASS, William, 17, Clarence Road, Chorlton-cum-Hardy, chemical merchant. (B.S., 5/5/23.) April 24. £146.
LLOYD, Llewellyn Farquhar, 8, Rene Road, Lower Easton, wholesale druggist. (B.S., 5/5/23.) April 27. £30.

Mortgages and Charges

[NOTE.—The Companies Consolidation Act, of 1908, provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]

BRIGGS'S PHARMACY STORES, LTD., Bristol. (M., 5/5/23.) Registered April 20, £900 debentures (filed under sec. 93 (3) of the Companies (Consolidation) Act 1908), present issue £849 16s. 9d.; general charge.
HOVEY AND LOWTHER, LTD., Wheelock, manufacturers of phosphoric acid powder. (M., 5/5/23.) Registered April 17, mortgage, to bank; charged on land and cottage at Wheelock. *Nil. April 10, 1922.
M.T. POLISHES, LTD., London, S.W. (M., 5/5/23.) Registered April 19, £150 debenture, to C. W. McP. Ivens, 8A, Templeton Place, Earl's Court, director of the company; general charge. *Nil. December 14, 1922.
WILSON (H. E.), LTD., Liverpool, paint manufacturers. (M., 5/5/23.) Registered April 17, £1,500 debentures; general charge. *£7,004. March 7, 1923.

London Gazette

Notice of Intended Dividend

FISHWICK, Albert Baden-Powell, carrying on business at 4, North Road, Longsight, under the style of BROWN AND CO., soap manufacturer. Last day for receiving proofs, May 16. Trustee, J. G. Gibson, Official Receiver, Byrom Street, Manchester.

Winding-Up Petition

CARLTON BLEACHING AND DYEING CO., LTD. (W.U.P. 5/5/23.) A petition for winding up the company has been presented and is to be heard at the Royal Courts of Justice, Strand, London, on May 8.

Partnerships Dissolved

ADSHEAD, RATCLIFFE AND CO. (Charles Coates RATCLIFFE and Lewis Coates RATCLIFFE), Belper, varnish, furniture cream, glue and size powder manufacturers, by mutual consent as from January 16, 1923. Debts received and paid by C. C. Ratcliffe, who will continue the business.
BITUMEN SOLUTIONS CO. (Edward Watson SMYTH and Colin Egbert PARKES), 329, High Holborn, London, W.C., by mutual consent as from March 12, 1923.
CASTLEGATE LAUNDRY AND DYE WORKS (Sydney Milton TOOTAL, George Frederick FLETCHER, Marsden Ambrose CRAWSHAW and Hubert Woodward CARTER), laundry proprietors and dyers, Castlegate Laundry, Castlegate, Lytham Road, Blackpool, by mutual consent as from April 4, 1923.

THE TOWERS MANUFACTURING CO. (Edward William HASDELL, William Lionel SIMMONS and William James Brownlow JEFFERY), manufacturers of polishes, St. Andrew's Road, Northampton, by mutual consent as from April 14, 1923. Debts received and paid by E. W. Hasdell.

Edinburgh Gazette

KEGO, Robert, and TUDHOPE, Kenneth Mackenzie, chemical manufacturers, 81, Dawson Road, Glasgow. Business transferred to Kenneth M. Tudhope, who will carry on the same under the name of the Citrolene Chemical Co. Mr. Tudhope will uplift all debts due to, and discharge all debts due by, the former firm.

New Companies Registered

BROWN AND CO. (DYES), LTD., 112, Bath Street, Glasgow. Dealers in dyes, chemicals, etc. Nominal capital, £5,000 in £1 shares.
DIAMOND BRAND PRODUCTS, LTD., 61, Rhodes Street, Holloway, N.7. Oil, enamel, lacquer and varnish specialist. Nominal capital, £2,000 in 1,000 preference shares of £1 and 10,000 founders' shares of 2s.
F. W. FAULDING & CO., LTD., incorporated in South Australia. British address: 76, Finsbury Pavement, London, E.C. Wholesale druggists, manufacturing chemists, etc. Nominal capital, £200,000 in £1 shares.
GROSVENOR SCIENTIFIC PRODUCTS, LTD., 12, Grosvenor Gardens, London, S.W.1. Manufacturers of refractory and other engineering and scientific materials, workers in ores, chemicals and precious metals, treaters of metals and ores by chemical processes, etc. Nominal capital, £500 in 1s. shares.
LONDON FERTILISER CO., LTD., 30, King William Street, London. Manufacturers, importers and exporters and dealers in all kinds of fertilisers, manures and soil sterilisers, etc. Nominal capital, £2,500 in £1 shares.
PREMIER SOAP CO., LTD., Ann Watson Street, Stoneferry, Hull. Soap manufacturers, pharmaceutical, manufacturing and general chemists, druggists, etc. Nominal capital, £100 in £1 shares.
PRODUCE AND CHEMICAL CO., LTD., 72, Mark Lane, London, E.C. Exporters and importers of and dealers in chemicals, etc. Nominal capital, £2,000 in £1 shares.
WOOD DISTILLATION (ENGLAND), LTD., Speech House Road, near Coleford, Glos. Distillers, importers and exporters of and dealers in the products and by-products resulting from distillation, etc. Nominal capital £15,000 in £1 shares.

Chemical Manufacturer's Bankruptcy

The statutory first meeting of creditors of William W. Coe, Junior, chemical manufacturer, late of 24 and 26, Holborn, London, E.C., was held on Tuesday, in London, Mr. Walter Boyle, Senior Official Receiver, presiding. The debtor did not attend; no statement of his affairs was lodged and it was said that he had failed to surrender to the proceedings. The receiving order was made on the petition of a creditor for £131, who alleged as the act of bankruptcy the debtor's non-compliance with the requirements of a statutory bankruptcy notice. The Official Receiver's Inspector had attended at the address given in the receiving order to be informed that the debtor was in New York. He had formerly carried on business at that address but the business had been converted into a limited company, in which he was said to have no interest. The meeting passed a resolution for the appointment of Mr. Ernest James, C.A., St. Laurence House, Trump Street, E.C., as trustee to administer the estate in bankruptcy.

